ÉTUDE SUR LA SANTÉ DANS LA RÉGION DE

Belledune

AREA HEALTH STUDY

Belledune • Petit Rocher • Pointe-Verte

Appendix AA - Data Considered in Assessment

Prepared for: Department of Health and Wellness, Government of New Brunswick

February 2005

Environmental
& Occupational Health+Plus

GOSS GILROY INC.
Management Consultants
Conseillers en gestion

SENES Consultants Limited

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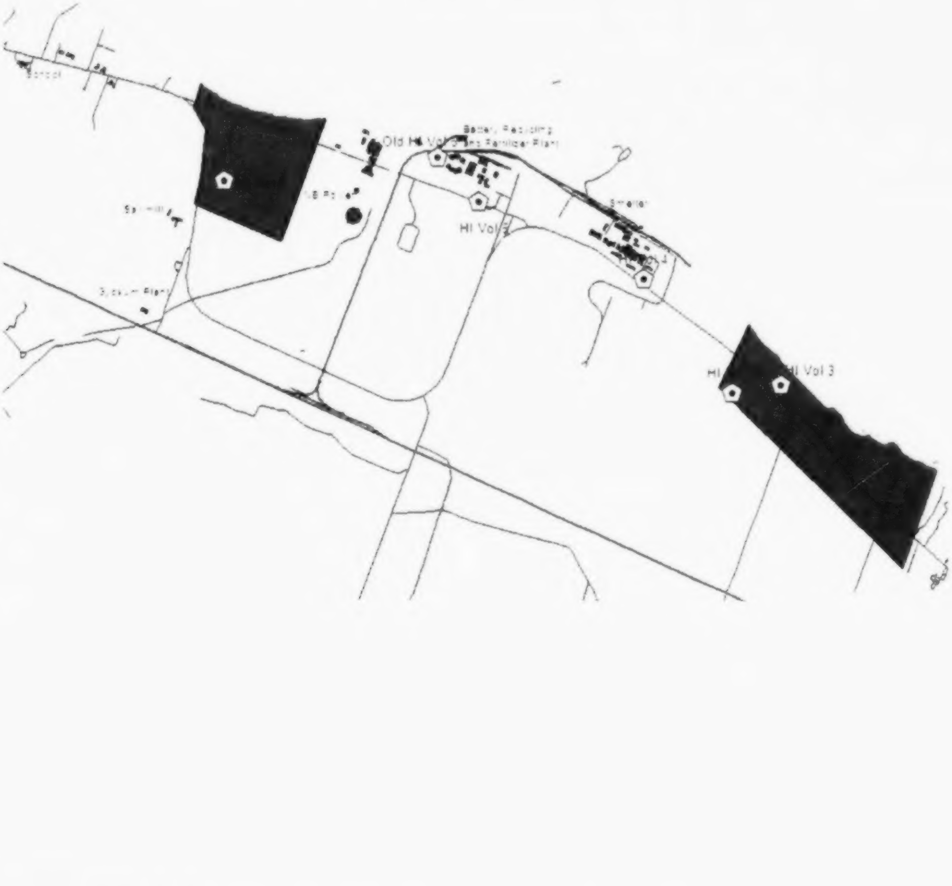
The following sections provide the data that was considered for the HHRA. Both raw data, data summaries and empirical relationships are presented. The media considered were air, soil, backyard garden vegetables, seafood, wild game and well water.

A1.0 Air

Hi-vol samplers are operated as part of the Noranda EMP and analyzed for SO_4, particulate and selected metals (Brunswick Mining and Smelting Corporation, 2004a). Other air sampling (e.g. NB Power) concerning SO_2 or particulate are not presented here since metals are not measured as part of that program. Figure A1 shows the air sampling locations in the GBA. As seen from the figure there 6 monitoring locations, 3 located within the industrial area, 1 within Townsite #2 and 2 within Lower Belledune. Table A1.1 provides a summary of the air quality results considered for the current time period. Appendix B provides a detailed discussion on the air quality modeling and how this measured data was considered in the air quality modeling.

Figure A1 Hi-Vol Air Sampling Locations



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A1.0 Air

Hi-vol samplers are operated as part of the Noranda EMP and analyzed for SO_4, particulate and selected metals (Brunswick Mining and Smelting Corporation, 2004a). Other air sampling (e.g. NB Power) concerning SO_2 or particulate are not presented here since metals are not measured as part of that program. Figure A1 shows the air sampling locations in the GBA. As seen from the figure there 6 monitoring locations, 3 located within the industrial area, 1 within Townsite #2 and 2 within Lower Belledune. Table A1.1 provides a summary of the air quality results considered for the current time period. Appendix B provides a detailed discussion on the air quality modeling and how this measured data was considered in the air quality modeling.

Figure A1 Hi-Vol Air Sampling Locations

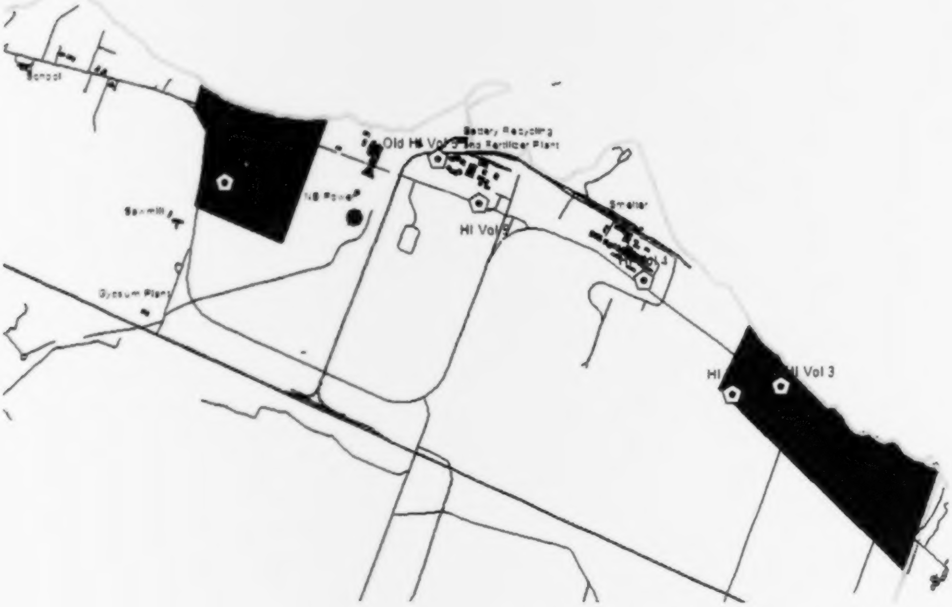


Table A1.1 Air Concentrations (μg/m³) by Noranda EMP (2000 – 2002)

Location	Date	Arsenic	Cadmium	Lead	Thallium
Hi Vol 1	01JAN00	0.0031	0.0012	0.067	<0.006
Hi Vol 1	07JAN00	0.0080	0.0086	0.037	<0.006
Hi Vol 1	13JAN00	0.0055	0.0025	0.172	<0.006
Hi Vol 1	19JAN00	0.0129	0.0055	0.380	<0.006
Hi Vol 1	25JAN00	0.0031	0.0031	0.116	<0.006
Hi Vol 1	06FEB00	0.0043	0.0012	0.092	<0.006
Hi Vol 1	12FEB00	0.0031	0.0006	0.043	<0.006
Hi Vol 1	18FEB00	0.0067	0.0067	0.135	0.006
Hi Vol 1	24FEB00	0.0184	0.0159	0.356	0.012
Hi Vol 1	01MAR00	0.0049	0.0055	0.129	<0.006
Hi Vol 1	07MAR00	0.0208	0.0156	0.607	0.012
Hi Vol 1	13MAR00	0.0055	0.0034	0.184	<0.006
Hi Vol 1	19MAR00	0.0313	0.0126	1.085	0.006
Hi Vol 1	25MAR00	0.0147	0.0095	0.460	0.006
Hi Vol 1	31MAR00	0.0061	0.0034	0.153	<0.006
Hi Vol 1	06APR00	0.0043	0.0006	0.178	<0.006
Hi Vol 1	12APR00	0.0123	0.0147	0.319	0.012
Hi Vol 1	18APR00	0.0288	0.0116	0.490	0.006
Hi Vol 1	24APR00	0.0147	0.0092	0.288	0.006
Hi Vol 1	06MAY00	0.0092	0.0067	0.3360	0.005
Hi Vol 1	12MAY00	0.0466	0.0374	0.6160	0.020
Hi Vol 1	18MAY00	0.0307	0.0245	0.6760	0.008
Hi Vol 1	24MAY00	0.0031	0.0006	0.0650	<0.001
Hi Vol 1	30MAY00	0.0166	0.0080	0.3230	<0.001
Hi Vol 1	05JUN00	0.0313	0.0061	0.701	<0.001
Hi Vol 1	11JUN00	0.0074	0.0031	0.126	0.001
Hi Vol 1	17JUN00	0.0343	0.0123	0.373	0.006
Hi Vol 1	23JUN00	0.0067	0.0031	0.096	0.001
Hi Vol 1	29JUN00	0.0043	0.0037	0.204	0.001
Hi Vol 1	05JUL00	0.0028	0.0021	0.129	<0.001
Hi Vol 1	11JUL00	0.0248	0.0530	0.791	0.008
Hi Vol 1	17JUL00	0.0028	0.0003	0.086	<0.001
Hi Vol 1	23JUL00	0.0028	0.0003	0.037	<0.001
Hi Vol 1	29JUL00	0.0058	0.0015	0.159	<0.001
Hi Vol 1	04AUG00	0.0138	0.0080	0.299	0.003
Hi Vol 1	10AUG00	0.0282	0.0050	0.211	<0.0006
Hi Vol 1	16AUG00	0.0031	0.0010	0.083	<0.0006
Hi Vol 1	22AUG00	0.0031	0.0020	0.070	<0.0006
Hi Vol 1	28AUG00	0.0074	0.0240	0.236	0.001
Hi Vol 1	03SEP00	0.0032	0.0006	0.063	< 0.001
Hi Vol 1	09SEP00	0.0032	0.0006	0.080	< 0.001
Hi Vol 1	15SEP00	0.0051	< 0.0006	0.033	< 0.001
Hi Vol 1	21SEP00	0.0143	0.0012	0.058	< 0.001
Hi Vol 1	27SEP00	0.0192	0.0037	0.196	0.001
Hi Vol 1	09OCT00	0.0049	0.0006	0.111	<0.001
Hi Vol 1	15OCT00	0.0049	<0.0006	0.133	<0.001
Hi Vol 1	27OCT00	0.0159	0.0080	0.400	0.001
Hi Vol 1	02NOV00	0.0037	0.0018	0.077	0.002
Hi Vol 1	08NOV00	0.0098	0.0043	0.363	0.004
Hi Vol 1	14NOV00	0.0012	<0.0006	0.008	
Hi Vol 1	20NOV00	0.0037	<0.0006	0.069	<0.001
Hi Vol 1	26NOV00	0.0110	0.0043	0.173	0.002
Hi Vol 1	02DEC00	0.0037	0.0006	0.189	<0.001
Hi Vol 1	08DEC00	0.0086	0.0018	0.315	0.001

Location	Date	Arsenic	Cadmium	Lead	Thallium
Hi Vol 1	14DEC00	0.0061	0.0012	0.157	0.002
Hi Vol 1	20DEC00	0.0043	0.0018	0.056	<0.001
Hi Vol 1	26DEC00	0.0166	0.0025	0.515	0.001
Hi Vol 1	01JAN01	0.0123	0.0055	0.139	0.003
Hi Vol 1	07JAN01	0.0135	0.0061	0.231	0.004
Hi Vol 1	13JAN01	0.0018	<0.0006	0.065	<0.001
Hi Vol 1	19JAN01	0.0153	0.0031	0.186	0.005
Hi Vol 1	25JAN01	0.0006	<0.0006	0.025	<0.001
Hi Vol 1	31JAN01	0.0061	0.0006	0.078	<0.001
Hi Vol 1	06FEB01	0.0003	<0.0006	0.001	<0.001
Hi Vol 1	12FEB01	0.0021	0.0006	0.036	<0.001
Hi Vol 1	18FEB01	0.0015	0.0006	0.038	<0.001
Hi Vol 1	24FEB01	0.0034	0.0006	0.049	<0.001
Hi Vol 1	02MAR01	0.0012	<0.0006	0.050	<0.001
Hi Vol 1	08MAR01	0.0061	0.0006	0.097	<0.001
Hi Vol 1	14MAR01	0.0012	0.0006	0.060	<0.001
Hi Vol 1	20MAR01	0.0141	0.0067	0.259	0.004
Hi Vol 1	26MAR01	0.0025	0.0012	0.077	<0.001
Hi Vol 1	01APR01	0.0025	0.0018	0.072	<0.001
Hi Vol 1	07APR01	0.0067	0.0025	0.170	0.001
Hi Vol 1	13APR01	0.0031	0.0018	0.072	<0.001
Hi Vol 1	19APR01	0.0043	0.0012	0.080	<0.001
Hi Vol 1	25APR01	0.0037	0.0018	0.087	<0.001
Hi Vol 1	01MAY01	0.0533	0.0116	0.473	0.004
Hi Vol 1	07MAY01	0.0061	0.0012	0.099	<0.001
Hi Vol 1	13MAY01	0.0055	0.0018	0.101	<0.001
Hi Vol 1	19MAY01	0.0012	0.0006	0.056	<0.001
Hi Vol 1	25MAY01	0.0092	0.0018	0.260	0.001
Hi Vol 1	31MAY01	0.0037	0.0031	0.049	<0.001
Hi Vol 1	24JUN01	0.0028	0.0006	0.036	
Hi Vol 1	30JUN01	0.0156	0.0159	0.486	0.012
Hi Vol 1	06JUL01	0.0025	0.0037	0.084	<0.001
Hi Vol 1	12JUL01	0.0025	0.0018	0.049	<0.001
Hi Vol 1	18JUL01	0.0123	0.0061	0.338	0.001
Hi Vol 1	24JUL01	0.0049	0.0049	0.144	<0.001
Hi Vol 1	30JUL01	0.0215	0.0067	0.399	<0.001
Hi Vol 1	05AUG01	0.0086	0.0043	0.279	0.002
Hi Vol 1	11AUG01	0.0037	0.0006	0.128	<0.001
Hi Vol 1	17AUG01	0.0141	0.0055	0.347	0.005
Hi Vol 1	23AUG01	0.0092	0.0043	0.264	0.002
Hi Vol 1	29AUG01	0.0018	<0.0006	0.073	<0.001
Hi Vol 1	10SEP01	0.0162	0.0037	0.240	<0.006
Hi Vol 1	16SEP01	0.0070	0.0025	0.083	<0.006
Hi Vol 1	22SEP01	0.0046	0.0006	0.050	<0.006
Hi Vol 1	28SEP01	0.0034	0.0006	0.089	<0.006
Hi Vol 1	04OCT01	0.0055	0.0031	0.147	<0.001
Hi Vol 1	10OCT01	0.0086	0.0067	0.211	0.002
Hi Vol 1	16OCT01	0.0055	0.0031	0.409	<0.001
Hi Vol 1	22OCT01	0.0025	0.0006	0.085	<0.001
Hi Vol 1	28OCT01	<0.0006	<0.0006	0.059	<0.001
Hi Vol 1	03NOV01	0.0047	0.0012	0.196	<0.001
Hi Vol 1	09NOV01	0.0031	0.0006	0.132	<0.001
Hi Vol 1	15NOV01	0.0123	0.0067	0.230	0.002
Hi Vol 1	21NOV01	0.0049	0.0006	0.199	0.001
Hi Vol 1	27NOV01	0.7982	0.0104	0.463	0.001
Hi Vol 1	03DEC01	0.0037	0.0012	0.187	<0.001
Hi Vol 1	09DEC01	0.0178	0.0184	0.303	0.003

Location	Date	Arsenic	Cadmium	Lead	Thallium
Hi Vol 1	15DEC01	0.0086	0.0018	0.708	<0.001
Hi Vol 1	21DEC01	0.0116	0.0043	0.524	0.004
Hi Vol 1	27DEC01	0.0300	0.0251	0.592	0.008
Hi Vol 1	02JAN02	0.0135	0.0043	0.313	<0.001
Hi Vol 1	08JAN02	0.0025	0.0018	0.067	0.001
Hi Vol 1	14JAN02	0.0147	0.0092	0.349	0.004
Hi Vol 1	20JAN02	0.0110	0.0043	0.178	0.003
Hi Vol 1	26JAN02	0.0061	0.0055	0.190	0.003
Hi Vol 1	01FEB02	0.0015	0.0006	0.049	0.001
Hi Vol 1	07FEB02	0.0064	0.0043	0.184	0.004
Hi Vol 1	13FEB02	0.0064	0.0018	0.159	0.002
Hi Vol 1	19FEB02	0.0187	0.0104	0.527	0.004
Hi Vol 1	25FEB02	0.0028	0.0018	0.061	0.002
Hi Vol 1	02APR02	0.0061	0.0104	0.289	0.013
Hi Vol 1	08APR02	0.0123	0.0067	0.423	0.003
Hi Vol 1	14APR02	0.0037	0.001	0.079	0.001
Hi Vol 1	20APR02	0.0037	0.0006	0.129	0.001
Hi Vol 1	26APR02	0.002	0.001	0.043	0.001
Hi Vol 1	08MAY02	0.0043	< 0.0012	0.195	< 0.001
Hi Vol 1	26MAY02	0.0006	0.0012	0.111	< 0.001
Hi Vol 1	01JUN02	0.0147	0.0018	0.203	<0.001
Hi Vol 1	13JUN02	0.0049	0.0006	0.091	<0.001
Hi Vol 1	19JUN02	0.0012	0.0006	0.166	<0.001
Hi Vol 1	25JUN02	0.0025	0.0006	0.092	<0.001
Hi Vol 1	01JUL02	0.0075	0.0010	0.133	0.006
Hi Vol 1	07JUL02	<0.0001	0.0003	0.025	0.005
Hi Vol 1	13JUL02	0.0001	0.0004	0.035	0.007
Hi Vol 1	19JUL02	<0.0001	0.0001	0.018	0.003
Hi Vol 1	25JUL02	0.0011	0.0002	0.049	0.002
Hi Vol 1	31JUL02	0.0016	<0.0001	0.006	0.002
Hi Vol 1	06AUG02	0.0039	0.0007	0.054	<0.001
Hi Vol 1	12AUG02	0.0066	0.0019	0.281	<0.001
Hi Vol 1	18AUG02	0.0047	0.0015	0.122	<0.001
Hi Vol 1	24AUG02	0.0088	0.0018	0.165	<0.001
Hi Vol 1	30AUG02	0.0051	0.0021	0.158	<0.001
Hi Vol 1	05SEP02	0.0411	0.0064	0.478	<.001
Hi Vol 1	11SEP02	0.0411	0.0064	0.478	<.001
Hi Vol 1	17SEP02	0.0049	<.001	0.116	<.001
Hi Vol 1	23SEP02	0.0153	<.001	0.202	<.001
Hi Vol 1	29SEP02	0.0107	<.001	0.141	<.001
Hi Vol 1	11OCT02	0.0116	0.0025	0.202	<0.001
Hi Vol 1	17OCT02	<0.0006	<0.0006	0.037	<0.001
Hi Vol 1	23OCT02	0.0025	0.0006	0.116	<0.001
Hi Vol 1	29OCT02	0.0012	<0.0006	0.061	<0.001
Hi Vol 1	10NOV02	0.0023	<0.0006	0.049	<0.001
Hi Vol 1	16NOV02	0.0006	0.0006	0.031	<0.001
Hi Vol 1	22NOV02	0.0025	0.0006	0.086	<0.001
Hi Vol 1	28NOV02	0.0025	0.0012	0.123	<0.001
Hi Vol 1	04DEC02	0.0006		0.043	<0.001
Hi Vol 1	10DEC02	0.0012		0.037	<0.001
Hi Vol 1	16DEC02	0.0025	0.0018	0.104	<0.001
Hi Vol 1	22DEC02			0.018	<0.001
Hi Vol 1	28DEC02			0.031	<0.001
Hi Vol 2	01JAN00	0.0031	0.0012	0.043	<0.006
Hi Vol 2	07JAN00	0.0049	0.0025	0.233	0.006
Hi Vol 2	13JAN00	0.0031	0.0018	0.147	<0.006
Hi Vol 2	19JAN00	0.0025	0.0006	0.080	<0.006

Location	Date	Arsenic	Cadmium	Lead	Thallium
Hi Vol 2	31JAN00	0.0135	0.0221	0.435	0.006
Hi Vol 2	12FEB00	0.0037	0.0006	0.074	<0.006
Hi Vol 2	18FEB00	0.0003	0.0012	0.067	<0.006
Hi Vol 2	24FEB00	0.0012	0.0006	0.03j	<0.006
Hi Vol 2	01MAR00	0.0025	0.0031	0.061	<0.006
Hi Vol 2	07MAR00	0.0012	0.0003	0.025	<0.006
Hi Vol 2	13MAR00	0.0018	0.0003	0.049	<0.006
Hi Vol 2	19MAR00	0.0098	0.0083	0.116	0.006
Hi Vol 2	25MAR00	0.0208	0.0126	0.349	0.006
Hi Vol 2	31MAR00	0.0025	0.0003	0.025	<0.006
Hi Vol 2	06APR00	0.0018	<0.0001	0.018	<0.006
Hi Vol 2	12APR00	0.0123	0.0092	0.300	0.006
Hi Vol 2	18APR00	0.0074	0.0031	0.116	0.006
Hi Vol 2	24APR00	0.0025	<0.0001	0.061	<0.006
Hi Vol 2	30APR00	0.0012	<0.0001	0.043	<0.006
Hi Vol 2	06MAY00	0.0349	0.0178	0.2500	0.009
Hi Vol 2	12MAY00	0.0025	0.0006	0.0480	<0.001
Hi Vol 2	18MAY00	0.0043	0.0012	0.0600	<0.001
Hi Vol 2	24MAY00	0.0031	0.0006	0.0850	<0.001
Hi Vol 2	30MAY00	0.0821	0.0110	0.2450	<0.001
Hi Vol 2	05JUN00	0.0245	0.0147	0.289	0.002
Hi Vol 2	11JUN00	0.0086	0.0055	0.086	0.001
Hi Vol 2	17JUN00	0.0067	0.0012	0.056	<0.001
Hi Vol 2	23JUN00	0.0043	0.0012	0.043	<0.001
Hi Vol 2	29JUN00	0.0049	0.0012	0.072	<0.001
Hi Vol 2	05JUL00	0.0113	0.0126	0.276	
Hi Vol 2	11JUL00	0.0015	<0.0006	0.018	<0.001
Hi Vol 2	17JUL00	0.0193	0.0046	0.184	
Hi Vol 2	23JUL00	0.0046	0.0015	0.031	<0.001
Hi Vol 2	29JUL00	0.0414	0.0230	0.386	0.012
Hi Vol 2	04AUG00	0.0282	0.0090	0.310	0.003
Hi Vol 2	10AUG00	0.0159	0.0120	0.162	0.001
Hi Vol 2	16AUG00	0.0043	0.0010	0.089	<0.0006
Hi Vol 2	22AUG00	0.0006	0.0010	0.034	<0.0006
Hi Vol 2	28AUG00	0.0006	0.0010	0.040	<0.0006
Hi Vol 2	03SEP00	0.0014	< 0.0006	0.010	< 0.001
Hi Vol 2	09SEP00	0.0020	< 0.0006	0.006	< 0.001
Hi Vol 2	15SEP00	0.0412	0.0172	0.390	0.009
Hi Vol 2	21SEP00	0.0192	0.0031	0.067	0.001
Hi Vol 2	27SEP00	0.0063	0.0018	0.148	< 0.001
Hi Vol 2	09OCT00	0.0012	<0.0006	0.027	<0.001
Hi Vol 2	15OCT00	0.0037	<0.0006	0.045	<0.001
Hi Vol 2	02NOV00	0.0012	0.0006	0.037	<0.001
Hi Vol 2	08NOV00	0.0080	0.0012	0.111	0.001
Hi Vol 2	14NOV00	0.0178	0.0074	0.184	0.012
Hi Vol 2	20NOV00	0.0043	0.0006	0.054	<0.001
Hi Vol 2	08DEC00	0.0012	<0.0006	0.050	<0.001
Hi Vol 2	14DEC00	0.0031	0.0006	0.024	0.001
Hi Vol 2	20DEC00	0.0006	<0.0006	0.005	<0.001
Hi Vol 2	26DEC00	0.0006	<0.0006	0.010	<0.001
Hi Vol 2	01JAN01	<0.0006	0.0031	0.028	0.001
Hi Vol 2	07JAN01	0.0018	0.0006	0.036	<0.001
Hi Vol 2	13JAN01	<0.0006	<0.0006	0.015	<0.001
Hi Vol 2	19JAN01	0.0031	0.0012	0.050	0.006
Hi Vol 2	25JAN01	<0.0006	<0.0006	0.013	<0.001
Hi Vol 2	31JAN01	0.0037	<0.0006	0.018	<0.001
Hi Vol 2	12FEB01	0.0003	<0.0006	0.003	<0.001

Location	Date	Arsenic	Cadmium	Lead	Thallium
Hi Vol 2	18FEB01	0.0009	<0.0006	0.001	<0.001
Hi Vol 2	24FEB01	0.0015	<0.0006	0.003	<0.001
Hi Vol 2	02MAR01	0.0184	0.0025	0.037	0.001
Hi Vol 2	08MAR01	0.0092	0.0006	0.055	<0.001
Hi Vol 2	14MAR01	0.0031	0.0006	0.174	<0.001
Hi Vol 2	20MAR01	0.0055	0.0031	0.155	0.002
Hi Vol 2	26MAR01	0.0018	0.0012	0.046	<0.001
Hi Vol 2	01APR01	0.0129	0.0031	0.154	0.001
Hi Vol 2	07APR01	0.0055	0.0025	0.120	0.001
Hi Vol 2	13APR01	0.0116	0.0037	0.167	0.002
Hi Vol 2	19APR01	0.0025	0.0012	0.041	<0.001
Hi Vol 2	25APR01	0.0018	0.0012	0.053	<0.001
Hi Vol 2	01MAY01	0.0215	0.0104	0.296	0.003
Hi Vol 2	07MAY01	0.0006	<0.0006	0.064	<0.001
Hi Vol 2	13MAY01	0.0104	0.0061	0.144	0.004
Hi Vol 2	19MAY01	0.0215	0.0092	0.677	0.004
Hi Vol 2	25MAY01	0.0049	0.0006	0.080	<0.001
Hi Vol 2	31MAY01	0.0012	0.0006	0.028	<0.001
Hi Vol 2	24JUN01	0.0015	0.0006	0.018	
Hi Vol 2	30JUN01	0.0021	0.0006	0.036	
Hi Vol 2	06JUL01	0.0049	0.0086	0.185	<0.001
Hi Vol 2	12JUL01	0.0380	0.0190	0.270	0.007
Hi Vol 2	18JUL01	0.0080	0.0074	0.326	0.001
Hi Vol 2	24JUL01	0.0025	0.0006	0.040	<0.001
Hi Vol 2	30JUL01	0.0031	0.0037	0.140	<0.001
Hi Vol 2	05AUG01	0.0037	0.0012	0.076	0.001
Hi Vol 2	11AUG01	0.0012	<0.0006	0.040	<0.001
Hi Vol 2	17AUG01	0.0104	0.0031	0.213	0.003
Hi Vol 2	23AUG01	0.0172	0.0080	0.165	0.001
Hi Vol 2	29AUG01	0.0012	<0.0006	0.027	<0.001
Hi Vol 2	10SEP01	0.0018	<0.0006	0.040	<0.006
Hi Vol 2	16SEP01	0.0021	<0.0006	0.044	<0.006
Hi Vol 2	22SEP01	0.0211	0.0129	0.291	
Hi Vol 2	28SEP01	0.0009	<0.0006	0.026	<0.006
Hi Vol 2	04OCT01	0.0012	<0.0006	0.025	<0.001
Hi Vol 2	10OCT01	0.0012	<0.0006	0.020	<0.001
Hi Vol 2	16OCT01	0.0129	0.0037	0.276	0.004
Hi Vol 2	22OCT01	0.0006	<0.0006	0.023	<0.001
Hi Vol 2	28OCT01	<0.0006	<0.0006	0.015	<0.001
Hi Vol 2	03NOV01	0.0020	0.0010	0.064	0.001
Hi Vol 2	09NOV01	0.0018	<0.0006	0.034	<0.001
Hi Vol 2	15NOV01	0.0043	0.0006	0.052	<0.001
Hi Vol 2	21NOV01	0.0012	<0.0006	0.034	<0.001
Hi Vol 2	27NOV01	0.0018	<0.0006	0.052	<0.001
Hi Vol 2	03DEC01	0.0006	<0.0001	0.021	<0.001
Hi Vol 2	09DEC01	0.0012	<0.0001	0.028	<0.001
Hi Vol 2	15DEC01	0.0006	<0.0001	0.028	<0.001
Hi Vol 2	21DEC01	0.0018	0.0006	0.070	0.003
Hi Vol 2	27DEC01	0.0043	0.0006	0.046	0.003
Hi Vol 2	02JAN02	< 0.0001	0.0006	0.018	0.002
Hi Vol 2	08JAN02	0.0012	0.0006	0.006	0.001
Hi Vol 2	14JAN02	0.0012	<0.0012	0.031	0.001
Hi Vol 2	20JAN02	0.0110	0.0043	0.129	0.003
Hi Vol 2	26JAN02	0.0025	0.0006	0.055	0.002
Hi Vol 2	01FEB02	0.0077	0.0067	0.159	0.003
Hi Vol 2	07FEB02	0.0028	0.0006	0.049	0.002
Hi Vol 2	13FEB02	0.0040	0.0006	0.061	0.002

Location	Date	Arsenic	Cadmium	Lead	Thallium
Hi Vol 2	19FEB02	0.0028	0.0006	0.049	0.002
Hi Vol 2	25FEB02	0.0077	0.0043	0.135	0.003
Hi Vol 2	02APR02	0.0024	0.0043	0.055	0.001
Hi Vol 2	14APR02	0.0255	0.0103	0.749	0.003
Hi Vol 2	20APR02	0.0037	0.001	0.079	0.001
Hi Vol 2	26APR02	0.0245	0.0031	0.202	0.001
Hi Vol 2	02MAY02	0.0384	0.0110	0.597	0.002
Hi Vol 2	08MAY02	0.0030	< 0.0012	0.024	< 0.001
Hi Vol 2	20MAY02	0.0551	0.0186	1.239	0.010
Hi Vol 2	26MAY02	0.0104	0.0012	0.123	0.001
Hi Vol 2	01JUN02	0.0012	0.0003	0.027	<0.001
Hi Vol 2	13JUN02	<0.0001	<0.0001	0.105	<0.001
Hi Vol 2	19JUN02	0.1030	0.0103	0.600	0.004
Hi Vol 2	25JUN02	0.0012	0.0006	0.031	<0.001
Hi Vol 2	01JUL02	0.0058	0.0013	0.098	0.006
Hi Vol 2	07JUL02	0.0010	0.0004	0.049	0.008
Hi Vol 2	13JUL02	0.0035	0.0008	0.036	0.006
Hi Vol 2	19JUL02	0.0011	0.0002	0.031	0.001
Hi Vol 2	25JUL02	0.0033	0.0005	0.061	0.000
Hi Vol 2	31JUL02	0.0026	0.0002	0.018	0.002
Hi Vol 2	06AUG02	0.0004	0.0004	0.030	<0.001
Hi Vol 2	12AUG02	0.0131	0.0044	0.532	<0.001
Hi Vol 2	18AUG02	0.0569	0.0104	0.490	<0.001
Hi Vol 2	24AUG02	0.0826	0.0099	0.612	0.003
Hi Vol 2	30AUG02	0.0028	0.0009	0.085	<0.001
Hi Vol 2	05SEP02	0.0040	<.001	0.067	<.001
Hi Vol 2	11SEP02	0.0040	<.001	0.067	<.001
Hi Vol 2	17SEP02	0.0025	<.001	0.049	<.001
Hi Vol 2	23SEP02	0.0043	<.001	0.074	<.001
Hi Vol 2	29SEP02	0.0254	0.0012	0.199	<.001
Hi Vol 2	11OCT02	0.0049	0.0006	0.067	<0.001
Hi Vol 2	17OCT02	0.0343	0.0074	0.490	<0.001
Hi Vol 2	23OCT02	<0.0006	<0.0006	0.018	<0.001
Hi Vol 2	29OCT02	<0.0006	<0.0006	0.012	<0.001
Hi Vol 2	10NOV02	0.0049	0.0023	0.102	<0.001
Hi Vol 2	16NOV02	0.0025	<0.0006	0.245	<0.001
Hi Vol 2	22NOV02	0.0141	0.0074	0.251	0.006
Hi Vol 2	28NOV02	0.0006	<0.0006	0.025	<0.001
Hi Vol 2	04DEC02			0.031	<0.001
Hi Vol 2	10DEC02	0.0025	0.0006	0.031	<0.001
Hi Vol 2	16DEC02	0.0006		0.031	<0.001
Hi Vol 2	22DEC02			0.012	<0.001
Hi Vol 2	28DEC02			0.012	<0.001
Hi Vol 3	01JAN00	0.0037	0.0012	0.067	<0.006
Hi Vol 3	07JAN00	0.0215	0.0178	0.883	0.006
Hi Vol 3	13JAN00	0.0031	0.0012	0.110	<0.006
Hi Vol 3	19JAN00	0.0025	0.0006	0.110	<0.006
Hi Vol 3	25JAN00	0.0074	0.0055	0.110	<0.006
Hi Vol 3	31JAN00	0.0031	0.0025	0.037	0.006
Hi Vol 3	06FEB00	0.0043	0.0012	0.055	<0.006
Hi Vol 3	12FEB00	0.0037	0.0012	0.061	<0.006
Hi Vol 3	18FEB00	0.0092	0.0043	0.116	0.006
Hi Vol 3	24FEB00	0.0270	0.0257	0.423	0.025
Hi Vol 3	01MAR00	0.0049	0.0061	0.123	<0.006
Hi Vol 3	07MAR00	0.0356	0.0310	0.589	0.018
Hi Vol 3	13MAR00	0.0025	0.0009	0.043	<0.006
Hi Vol 3	19MAR00	0.0092	0.0040	0.147	<0.006

Location	Date	Arsenic	Cadmium	Lead	Thallium
Hi Vol 3	25MAR00	0.0092	0.0021	0.153	<0.006
Hi Vol 3	31MAR00	0.0067	0.0040	0.129	<0.006
Hi Vol 3	06APR00	0.0153	0.0166	0.325	0.012
Hi Vol 3	12APR00	0.0031	0.0037	0.086	0.006
Hi Vol 3	18APR00	0.0110	0.0043	0.172	<0.006
Hi Vol 3	24APR00	0.0012	<0.0001	0.025	<0.006
Hi Vol 3	06MAY00	0.0061	0.0049	0.1080	0.002
Hi Vol 3	12MAY00	0.0288	0.0190	0.3690	0.004
Hi Vol 3	18MAY00	0.0300	0.0129	0.3750	0.003
Hi Vol 3	24MAY00	0.0006	<0.0006	0.0050	<0.001
Hi Vol 3	30MAY00	0.0086	0.0031	0.1130	<0.001
Hi Vol 3	05JUN00	0.0791	0.0178	0.401	0.005
Hi Vol 3	11JUN00	0.0141	0.0086	0.146	0.003
Hi Vol 3	17JUN00	0.0043	0.0012	0.050	<0.001
Hi Vol 3	23JUN00	0.0031	0.0018	0.094	<0.001
Hi Vol 3	29JUN00	0.0184	0.0086	0.334	0.002
Hi Vol 3	05JUL00	0.0028	0.0021	0.080	
Hi Vol 3	11JUL00	0.0144	0.0156	0.300	0.003
Hi Vol 3	17JUL00	0.0028	0.0003	0.049	<0.001
Hi Vol 3	23JUL00	0.0028	0.0003	0.043	<0.001
Hi Vol 3	29JUL00	0.0021	0.0003	0.043	<0.001
Hi Vol 3	04AUG00	0.0135	0.0040	0.144	<0.0006
Hi Vol 3	10AUG00	0.0025	0.0010	0.046	<0.0006
Hi Vol 3	16AUG00	0.0025	0.0010	0.052	<0.0006
Hi Vol 3	22AUG00	0.0208	0.0040	0.113	<0.0006
Hi Vol 3	28AUG00	0.0074	0.0170	0.205	0.001
Hi Vol 3	03SEP00	0.0093	0.0061	0.147	0.001
Hi Vol 3	09SEP00	0.0020	0.0006	0.048	< 0.001
Hi Vol 3	15SEP00	0.0038	0.0006	0.061	< 0.001
Hi Vol 3	21SEP00	< 0.0008	0.0018	0.071	< 0.001
Hi Vol 3	27SEP00	0.0210	0.0067	0.327	0.002
Hi Vol 3	03OCT00	0.0172	0.0172	0.282	0.007
Hi Vol 3	09OCT00	0.0037	0.0012	0.049	<0.001
Hi Vol 3	15OCT00	0.0196	0.0116	0.250	0.002
Hi Vol 3	21OCT00	0.0129	0.0147	0.230	0.002
Hi Vol 3	02NOV00	0.0202	0.0067	0.371	0.006
Hi Vol 3	08NOV00	0.0049	0.0025	0.149	0.002
Hi Vol 3	14NOV00	0.0018	<0.0006	0.026	<0.001
Hi Vol 3	20NOV00	0.0049	0.0006	0.084	<0.001
Hi Vol 3	26NOV00	0.0110	0.0043	0.163	0.002
Hi Vol 3	02DEC00	0.0074	0.0037	0.291	0.001
Hi Vol 3	08DEC00	0.0049	0.0012	0.270	<0.001
Hi Vol 3	14DEC00	0.0043	0.0009	0.022	0.002
Hi Vol 3	20DEC00	0.0037	0.0012	0.016	<0.001
Hi Vol 3	26DEC00	0.0043	0.0012	0.133	<0.001
Hi Vol 3	01JAN01	0.0049	0.0037	0.072	0.002
Hi Vol 3	07JAN01	0.0067	0.0049	0.126	0.003
Hi Vol 3	13JAN01	0.0037	0.0006	0.069	<0.001
Hi Vol 3	19JAN01	0.0135	0.0031	0.147	0.005
Hi Vol 3	25JAN01	0.0012	<0.0006	0.072	<0.001
Hi Vol 3	31JAN01	0.0067	0.0006	0.089	<0.001
Hi Vol 3	06FEB01	0.0058	0.0018	0.045	0.002
Hi Vol 3	12FEB01	0.0003	<0.0006	<0.0006	<0.001
Hi Vol 3	24FEB01	0.0046	0.0012	0.051	0.001
Hi Vol 3	02MAR01	0.0031	0.0006	0.090	<0.001
Hi Vol 3	08MAR01	0.0061	0.0012	0.076	0.001
Hi Vol 3	14MAR01	<0.0006	0.0006	0.026	<0.001

Location	Date	Arsenic	Cadmium	Lead	Thallium
Hi Vol 3	20MAR01	0.0159	0.0049	0.246	0.003
Hi Vol 3	26MAR01	0.0031	0.0012	0.090	<0.001
Hi Vol 3	01APR01	0.0031	0.0018	0.069	<0.001
Hi Vol 3	07APR01	0.0080	0.0031	0.162	0.001
Hi Vol 3	13APR01	0.0031	0.0025	0.070	<0.001
Hi Vol 3	19APR01	0.0049	0.0018	0.088	<0.001
Hi Vol 3	25APR01	0.0257	0.0172	0.467	0.012
Hi Vol 3	01MAY01	0.0178	0.0043	0.226	0.000
Hi Vol 3	07MAY01	0.0435	0.0858	0.850	0.006
Hi Vol 3	13MAY01	0.0025	0.0006	0.043	<0.001
Hi Vol 3	19MAY01	0.0018	0.0006	0.036	<0.001
Hi Vol 3	25MAY01	0.0349	0.0074	0.335	0.005
Hi Vol 3	31MAY01	0.0067	0.0074	0.146	0.002
Hi Vol 3	24JUN01	0.0095	0.0043	0.100	
Hi Vol 3	30JUN01	0.0346	0.0251	0.685	0.018
Hi Vol 3	06JUL01	0.0018	0.0043	0.098	<0.001
Hi Vol 3	12JUL01	0.0006	0.0006	0.026	
Hi Vol 3	18JUL01	0.0037	0.0037	0.110	<0.001
Hi Vol 3	24JUL01	0.0092	0.0061	0.179	<0.001
Hi Vol 3	30JUL01	0.0043	0.0031	0.258	<0.001
Hi Vol 3	05AUG01	0.0104	0.0043	0.334	0.002
Hi Vol 3	11AUG01	0.1992	0.0153	0.515	0.007
Hi Vol 3	17AUG01	0.0227	0.0123	0.546	0.005
Hi Vol 3	23AUG01	0.0049	0.0031	0.163	0.002
Hi Vol 3	29AUG01	0.0043	0.0031	0.106	0.001
Hi Vol 3	04SEP01	0.0132	0.0055	0.247	<0.006
Hi Vol 3	10SEP01	0.0107	0.0031	0.232	<0.006
Hi Vol 3	16SEP01	0.0150	0.0043	0.127	<0.006
Hi Vol 3	22SEP01	0.0034	<0.0006	0.067	<0.006
Hi Vol 3	28SEP01	0.0021	0.0006	0.071	<0.006
Hi Vol 3	04OCT01	0.0012	<0.0006	0.072	<0.001
Hi Vol 3	10OCT01	0.0147	0.0141	0.345	0.003
Hi Vol 3	16OCT01	0.0086	0.0049	0.204	0.001
Hi Vol 3	22OCT01	0.0092	0.0061	0.350	<0.001
Hi Vol 3	28OCT01	0.0031	0.0025	0.140	0.001
Hi Vol 3	03NOV01	0.0092	0.0018	0.126	0.002
Hi Vol 3	09NOV01	0.0074	0.0018	0.254	<0.001
Hi Vol 3	15NOV01	0.0166	0.0055	0.279	0.001
Hi Vol 3	21NOV01	0.0055	0.0025	0.224	<0.001
Hi Vol 3	27NOV01	0.0153	0.0043	0.352	0.001
Hi Vol 3	03DEC01	0.0049	0.0037	0.150	0.001
Hi Vol 3	09DEC01	0.0141	0.0123	0.340	0.002
Hi Vol 3	15DEC01	0.0736	0.0490	2.835	0.014
Hi Vol 3	21DEC01	0.0300	0.0288	1.156	0.009
Hi Vol 3	27DEC01	0.0092	0.0055	0.230	0.004
Hi Vol 3	02JAN02	0.0074	0.0031	0.264	0.002
Hi Vol 3	08JAN02	0.0049	0.0031	0.129	0.001
Hi Vol 3	20JAN02	0.0147	0.0080	0.313	0.003
Hi Vol 3	26JAN02	0.0061	0.0080	0.276	0.003
Hi Vol 3	01FEB02	0.0028	0.0006	0.025	0.001
Hi Vol 3	07FEB02	0.0028	0.0031	0.098	0.003
Hi Vol 3	13FEB02	0.0040	0.0006	0.086	0.002
Hi Vol 3	19FEB02	0.0162	0.0092	0.484	0.004
Hi Vol 3	25FEB02	0.0015	0.0055	0.061	0.002
Hi Vol 3	15MAR02	0.001	<0.0012	0.076	<0.001
Hi Vol 3	02APR02	0.0050	0.0031	0.093	0.001
Hi Vol 3	08APR02	0.0110	0.0092	0.410	0.003

Location	Date	Arsenic	Cadmium	Lead	Thallium
Hi Vol 3	14APR02	0.0049	0.0018	0.116	0.001
Hi Vol 3	20APR02	0.0334	0.0229	0.588	0.012
Hi Vol 3	26APR02	0.0134	0.0031	0.165	0.001
Hi Vol 3	02MAY02	0.0031	0.0012	0.184	0.029
Hi Vol 3	08MAY02	0.0141	0.0012	0.319	< 0.001
Hi Vol 3	14MAY02	< 0.001	< 0.0012	0.086	< 0.001
Hi Vol 3	20MAY02	0.0277	0.0037	0.246	< 0.001
Hi Vol 3	26MAY02	0.0068	0.0025	0.247	< 0.001
Hi Vol 3	01JUN02	0.0062	0.0018	0.092	<0.001
Hi Vol 3	07JUN02	0.0061	0.0006	0.251	<0.001
Hi Vol 3	13JUN02	0.0123	0.0166	0.092	<0.001
Hi Vol 3	19JUN02	0.0098	0.0018	0.092	<0.001
Hi Vol 3	25JUN02	0.0024	0.0006	0.055	<0.001
Hi Vol 3	01JUL02	0.0070	0.0009	0.135	0.006
Hi Vol 3	07JUL02	0.0008	0.0002	0.033	0.010
Hi Vol 3	13JUL02	0.0031	0.0013	0.061	0.008
Hi Vol 3	19JUL02	0.0002	0.0001	0.012	0.002
Hi Vol 3	25JUL02	0.0011	0.0003	0.055	0.002
Hi Vol 3	31JUL02	0.0011	0.0002	0.012	0.002
Hi Vol 3	06AUG02	0.0025	0.0016	0.079	<0.001
Hi Vol 3	12AUG02	0.0084	0.0028	0.373	<0.001
Hi Vol 3	18AUG02	0.0075	0.0020	0.189	<0.001
Hi Vol 3	24AUG02	0.0074	0.0015	0.134	<0.001
Hi Vol 3	30AUG02	0.0045	0.0024	0.152	<0.001
Hi Vol 3	05SEP02	0.0052	<.001	0.129	<.001
Hi Vol 3	11SEP02	0.0052	<.001	0.129	<.001
Hi Vol 3	17SEP02	0.0080	<.001	0.141	<.001
Hi Vol 3	23SEP02	0.0043	<.001	0.141	<.001
Hi Vol 3	29SEP02	0.0337	0.0043	0.779	0.003
Hi Vol 3	05OCT02	0.0006	<0.0006	0.055	<0.001
Hi Vol 3	11OCT02	0.0080	0.0018	0.172	<0.001
Hi Vol 3	17OCT02	<0.0006	<0.0006	0.037	<0.001
Hi Vol 3	23OCT02	0.0049	0.0006	0.092	<0.001
Hi Vol 3	29OCT02	0.0086	0.0055	0.288	<0.001
Hi Vol 3	04NOV02	0.0037	0.0018	0.116	<0.001
Hi Vol 3	10NOV02	0.0037	0.0006	0.080	<0.001
Hi Vol 3	16NOV02	0.0233	0.0007	0.454	0.007
Hi Vol 3	22NOV02	0.0074	0.0025	0.202	<0.001
Hi Vol 3	28NOV02	0.0233	0.0129	0.809	<0.001
Hi Vol 3	04DEC02	0.0018	0.0012	0.061	<0.001
Hi Vol 3	10DEC02	0.0074	0.0031	0.184	<0.001
Hi Vol 3	16DEC02	0.0012	0.0025	0.061	<0.001
Hi Vol 3	22DEC02			0.025	<0.001
Hi Vol 3	28DEC02	0.0031	0.0012	0.116	<0.001

A1.1 Summary of Hi-vol Measurements

The following table (Table A1.2) summarizes concentrations in air of COPC metals measured at the three community stations. The measurements were 24-hour average concentrations collected every six days from 1996 through 2002. Average air concentrations of arsenic, cadmium and thallium decreased substantially over this time period. Zinc concentrations also decreased until 2001 with concentrations returning to 1996-1999 levels in 2002. Appendix B provides data related to combustion gases.

Table A1.2 Summary of Hi-Vol Measurements of COPC Metals (μg/m³)

Year	Hi Vol 1	Hi Vol 2	Hi Vol 3
Arsenic in Air			
1996	0.034 (max: 0.22 obs:59)	0.023 (max: 0.22 obs:59)	0.028 (max: 0.18 obs:59)
1997	0.049 (max: 0.54 obs:53)	0.051 (max: 0.6 obs:52)	0.128 (max: 1.95 obs:50)
1998	0.042 (max: 0.43 obs:60)	0.023 (max: 0.16 obs:54)	0.032 (max: 0.22 obs:60)
1999	0.033 (max: 0.3 obs:59)	0.018 (max: 0.12 obs:53)	0.018 (max: 0.14 obs:59)
2000	0.011 (max: 0.05 obs:57)	0.009 (max: 0.08 obs:54)	0.01 (max: 0.08 obs:59)
2001	0.008 (max: 0.05 obs:57)	0.005 (max: 0.04 obs:56)	0.014 (max: 0.2 obs:57)
2002	0.007 (max: 0.04 obs:50)	0.012 (max: 0.1 obs:48)	0.008 (max: 0.03 obs:55)
Cadmium in Air			
1996	0.012 (max: 0.11 obs:58)	0.006 (max: 0.05 obs:59)	0.008 (max: 0.04 obs:59)
1997	0.009 (max: 0.05 obs:53)	0.003 (max: 0.02 obs:52)	0.007 (max: 0.04 obs:50)
1998	0.022 (max: 0.53 obs:60)	0.005 (max: 0.03 obs:54)	0.008 (max: 0.04 obs:60)
1999	0.015 (max: 0.18 obs:59)	0.005 (max: 0.02 obs:53)	0.008 (max: 0.05 obs:59)
2000	0.006 (max: 0.05 obs:57)	0.004 (max: 0.02 obs:54)	0.006 (max: 0.03 obs:59)
2001	0.004 (max: 0.03 obs:57)	0.002 (max: 0.02 obs:56)	0.007 (max: 0.09 obs:57)
2002	0.002 (max: 0.01 obs:48)	0.003 (max: 0.02 obs:47)	0.003 (max: 0.02 obs:55)
Lead in Air			
1996	0.438 (max: 2.86 obs:59)	0.149 (max: 1.08 obs:59)	0.259 (max: 1.1 obs:59)
1997	0.324 (max: 2.56 obs:53)	0.125 (max: 1.04 obs:52)	0.283 (max: 1.95 obs:50)
1998	0.555 (max: 3.32 obs:60)	0.125 (max: 0.88 obs:54)	0.272 (max: 2.08 obs:60)
1999	0.767 (max: 8.44 obs:59)	0.189 (max: 0.91 obs:53)	0.301 (max: 1.82 obs:59)
2000	0.243 (max: 1.09 obs:57)	0.114 (max: 0.44 obs:54)	0.166 (max: 0.88 obs:59)
2001	0.182 (max: 0.71 obs:57)	0.093 (max: 0.68 obs:56)	0.252 (max: 2.84 obs:57)
2002	0.147 (max: 0.53 obs:52)	0.169 (max: 1.24 obs:51)	0.183 (max: 0.81 obs:56)
Thallium in Air			
1996	0.01 (max: 0.13 obs:59)	0.005 (max: 0.03 obs:59)	0.006 (max: 0.04 obs:59)
1997	0.006 (max: 0.02 obs:53)	0.004 (max: 0.01 obs:52)	0.005 (max: 0.01 obs:50)
1998	0.007 (max: 0.07 obs:60)	0.004 (max: 0.02 obs:54)	0.004 (max: 0.02 obs:60)
1999	0.008 (max: 0.07 obs:59)	0.004 (max: 0.01 obs:52)	0.005 (max: 0.03 obs:59)
2000	0.003 (max: 0.02 obs:56)	0.003 (max: 0.01 obs:52)	0.003 (max: 0.03 obs:58)
2001	0.002 (max: 0.01 obs:56)	0.001 (max: 0.01 obs:53)	0.003 (max: 0.02 obs:55)
2002	0.002 (max: 0.01 obs:52)	0.002 (max: 0.01 obs:51)	0.002 (max: 0.03 obs:56)
Zinc in Air			
1997	0.304 (max: 0.88 obs:26)	0.167 (max: 0.8 obs:26)	0.199 (max: 0.58 obs:25)
1998	0.32 (max: 4.54 obs:60)	0.097 (max: 0.55 obs:54)	0.284 (max: 5.89 obs:59)
1999	0.391 (max: 1.75 obs:59)	0.321 (max: 2.11 obs:52)	0.248 (max: 1.68 obs:59)
2000	0.098 (max: 0.64 obs:56)	0.075 (max: 0.62 obs:53)	0.072 (max: 0.33 obs:54)
2001	0.087 (max: 1.06 obs:57)	0.074 (max: 1.56 obs:56)	0.082 (max: 0.84 obs:57)
2002	0.374 (max: 2.08 obs:51)	0.359 (max: 1.58 obs:50)	0.463 (max: 2.86 obs:56)

A2.0 Soil

The maps presented below show means of measurements at the various locations (since 2003) for arsenic, lead and thallium. Thallium levels measured with a detection limit of 10 mg/kg not used in averaging. The locations for some CCNB (2004a, b) and GEMTEC (2004) measurements are approximate.

Figure A2 Arsenic Soil Measurements in Greater Belledune Area

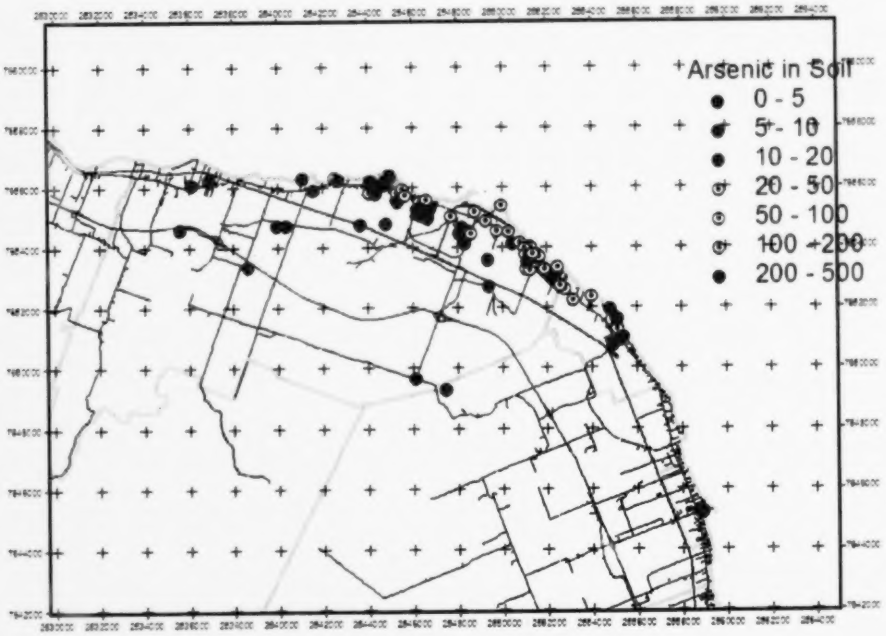


Figure A3 *Cadmium Soil Measurements in Greater Belledune Area*

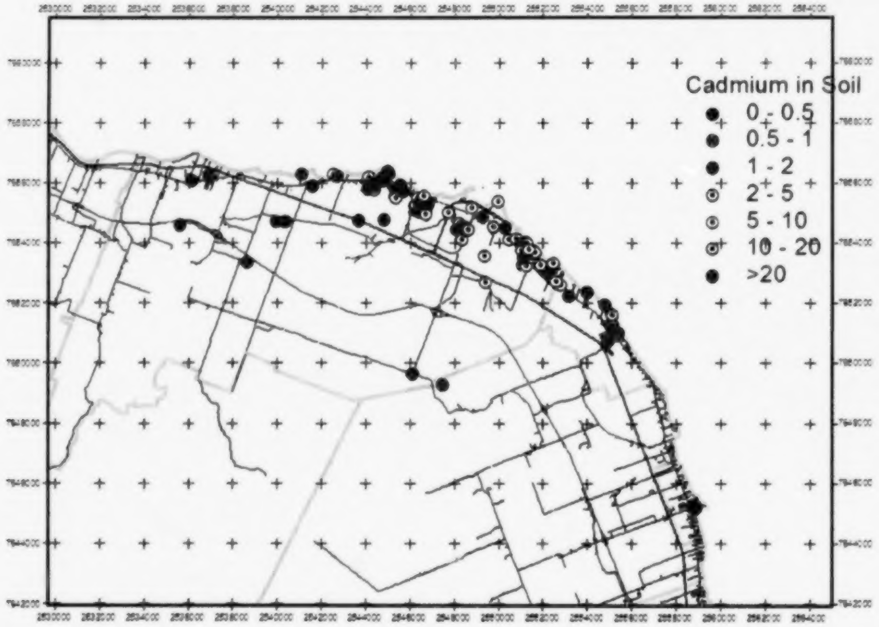


Figure A4 *Lead Soil Measurements in Greater Belledune Area*

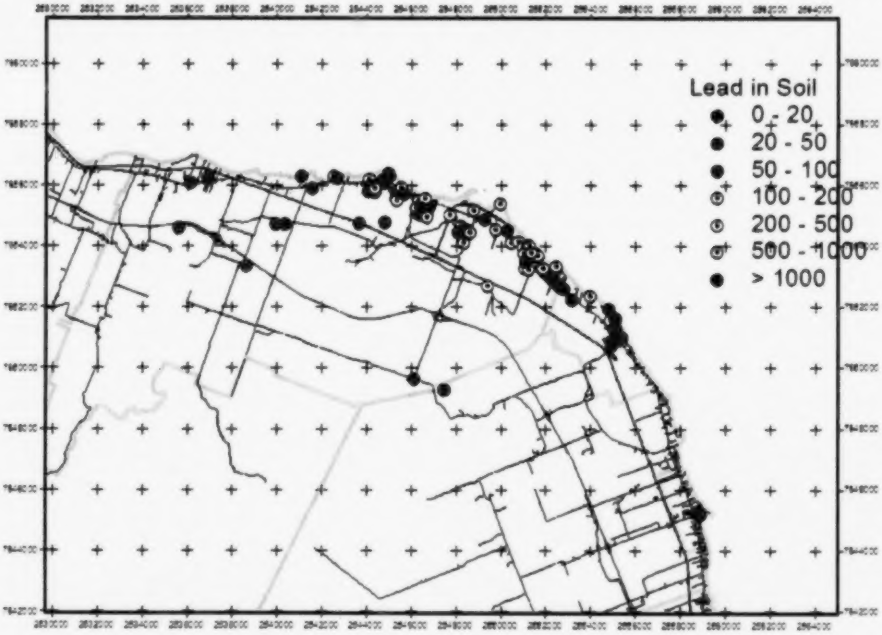
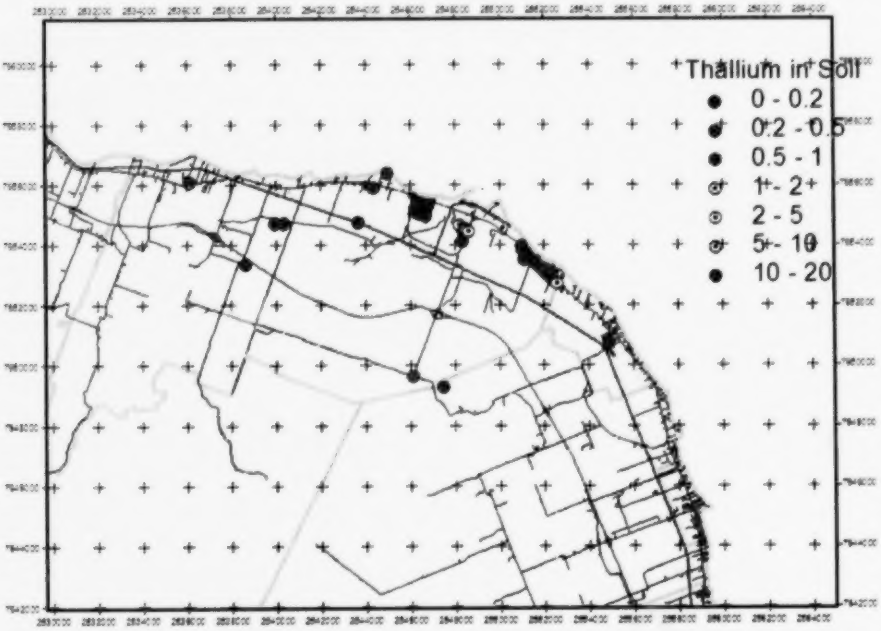


Figure A5 Thallium Soil Measurements in Greater Belledune Area



A2.1 Soil Concentrations used for COPC Selection

COPC were selected based on the measured soil concentrations available in June 2004 when the Methods Document for the HHRA study was written. Data were available from numerous sources including the Noranda EMP (Brunswick Mining and Smelting Corporation, 2004b), baseline sampling for the proposed Bennett facility (JWEL, 2003), the fall 2003 sampling by CCNB (2004a, b) and GEMTEC (2004) along with data collected in prior years by the New Brunswick government. The data considered were only from the GBA and excluded soil measurements collected from the industrial area. The combined data set was searched for the maximum measured concentration for each metal. Table A2.1 shows these maximum concentrations and the organization that collected the data.

Table A2.1 Maximum Metal Concentrations used in COPC Selection

Chemical	Year	Concentration (mg/kg)	Data ID	Location	Study Area	Source
Aluminum	2003	19200	GEMTBFXG	Townsite Ball Diamond	Belledune	GEMTEC
Antimony	2003	40	B075071	B075071	Belledune	CCNB
Arsenic	1996	111.5	Soil 11	Chalmers SouthWest	Lower Belledune	Noranda
Barium	2003	1280	B075095	B075095	Lower Belledune	CCNB
Beryllium	2003	1.4	B075059	B075059	Townsite	CCNB
Bismuth	2003	18	GEMPVBSS3	Pointe-Verte Bus	Pointe-Verte	GEMTEC
Boron	2003	11	GEMRBS7	Roherty Soil	Belledune	GEMTEC
Cadmium	2002	15	Soil 8	Chalmers	Lower Belledune	Noranda
Calcium	2003	18000	GEMPVBSS5	Pointe-Verte Bus	Pointe-Verte	GEMTEC
Chromium	2003	100	B075095	B075095	Lower Belledune	CCNB
Cobalt	2003	27.4	GEMDMS2	Townsite monitor	Townsite	GEMTEC
Copper	2003	351	GEMDMS2	Townsite monitor	Townsite	GEMTEC
Fluoride	1994	195	Soil 6	Townsite # 2	Townsite	Noranda
Iron	2003	51500	GEMDMS2	Townsite monitor	Townsite	GEMTEC
Lead	2003	2210	GEMDMS2	Townsite monitor	Townsite	GEMTEC
Lithium	2003	30.5	GEMBSC8S1	Belledune School Playpit	Belledune	GEMTEC
Magnesium	2003	12200	GEMDMS1	Townsite monitor	Townsite	GEMTEC
Manganese	2003	1445	B075051	B075051	Belledune	CCNB
Mercury	2004	0.11	Soil 6	Townsite #2	Townsite	Noranda
Molybdenum	2003	3	B075095	B075095	Lower Belledune	CCNB
Nickel	2003	69	B075059	B075059	Townsite	CCNB
Potassium	2003	1740	GEMDMS2	Townsite monitor	Townsite	GEMTEC
Rubidium	2003	23.9	GEMBSCXF	Belledune School Playground	Belledune	GEMTEC
Selenium	2003	2	GEMDMS2	Townsite monitor	Townsite	GEMTEC
Silver	2003	4.8	B075085	B075085	Pointe-Verte	CCNB
Sodium	2003	2010	GEMRBS7	Roherty Soil	Belledune	GEMTEC
Strontium	2003	367	B075087	B075087	Pointe-Verte	CCNB
Tellurium	2003	0.9	GEMPVBSS1	Pointe-Verte Bus	Pointe-Verte	GEMTEC
Thallium	1996	7	Garden HH2		Belledune	Noranda
Tin	2003	16.8	GEMDMS2	Townsite monitor	Townsite	GEMTEC
Uranium	2003	20	B075070	B075070	Belledune	CCNB
Vanadium	2003	223	B075095	B075095	Lower Belledune	CCNB
Zinc	2003	5320	GEMDMS2	Townsite monitor	Townsite	GEMTEC

Concentrations of dioxins and furans and polycyclic aromatic hydrocarbons (PAHs) were derived from Noranda data collected in 2004 (New Brunswick Mining and Smelting Corporation, 2004c). Concentrations of toluene and xylene were derived from the Bennett baseline soil survey conducted in 2003 (JWEL, 2003).

The Noranda EMP (Brunswick Mining and Smelting Corporation, 2004b) measured concentrations in soil at the forage and garden monitoring locations for the historical and current time periods, and these are shown in Table A2.2. Composite samples were collected in this program. The data included regular measurements between 2000 and 2003 and the results from a metal scan in 2004 at four locations within the residential area.

The Noranda EMP measured concentrations in soil at the forage and garden monitoring locations for the historical and current time periods are shown in Table A2.2. Composite samples were collected in this program. The data include regular measurements between 2000 and 2003 and the results from a metal scan in 2004 at four locations within the residential area.

Table A2.2 Summary of Noranda EMP Soil Measurements (mg/kg(dry))

Location	1975-1984	1985-1999	Current
Arsenic in Soil			
Garden A		22.2 (max: 22.7 obs:3)	
Garden C		34.39 (max: 46.8 obs:13)	24.49 (max: 28.1 obs:4)
Garden CC		9.122 (max: 10.9 obs:3)	
Garden D		20.44 (max: 20.5 obs:2)	17.05 (max: 19.5 obs:4)
Garden DD		18.94 (max: 21.5 obs:9)	19.71 (max: 20.8 obs:3)
Garden Dorig		26.97 (max: 28.3 obs:3)	
Garden E		25.51 (max: 37.4 obs:13)	
Garden EE1		15.71 (max: 23.8 obs:10)	15.48 (max: 17.2 obs:4)
Garden EE2		16.58 (max: 18.8 obs:3)	
Garden F		36.08 (max: 47.6 obs:5)	
Garden FF		21.71 (max: 93 obs:6)	
Garden G		22.04 (max: 27.9 obs:7)	
Garden GG1		13.89 (max: 15.7 obs:3)	
Garden GG2		14.92 (max: 16.3 obs:4)	13.73 (max: 15.5 obs:4)
Garden H1		14.36 (max: 16.5 obs:2)	12.96 (max: 13 obs:1)
Garden H2		15.5 (max: 24.6 obs:6)	
Garden HH1		20.13 (max: 24.9 obs:2)	
Garden HH2		25.42 (max: 30.4 obs:4)	
Garden I		22.49 (max: 33.4 obs:13)	20.31 (max: 22.6 obs:4)
Garden II		17.24 (max: 22.8 obs:14)	
Garden J		19.27 (max: 27.6 obs:13)	13.08 (max: 17.9 obs:4)
Garden KK		24.39 (max: 27.3 obs:4)	17.9 (max: 22.5 obs:4)
Garden MM		8.892 (max: 10.4 obs:5)	6.26 (max: 6.42 obs:2)
Garden N			10 (max: 10 obs:1)
Garden NN		14.72 (max: 17.9 obs:3)	
Garden O		18.77 (max: 32.5 obs:10)	
Garden P		14.12 (max: 17.9 obs:13)	13.21 (max: 16.7 obs:4)
Garden PP		23.79 (max: 44.4 obs:4)	4.88 (max: 4.88 obs:1)
Garden PP2		18.08 (max: 18.1 obs:1)	11.38 (max: 11.4 obs:1)
Garden QQ		17.08 (max: 17.1 obs:1)	
Garden T		16.31 (max: 20 obs:5)	15.4 (max: 15.4 obs:1)
Garden TT1		20.09 (max: 29 obs:8)	10.3 (max: 10.3 obs:1)
Garden TT2		22 (max: 22 obs:1)	
Garden U		28.78 (max: 53 obs:10)	
Garden W		11.23 (max: 16.4 obs:13)	13.33 (max: 15 obs:4)
Garden X		21.1 (max: 23.5 obs:3)	
Garden Y		27.71 (max: 30.8 obs:5)	
Soil 1	82.43 (max: 125 obs:7)	95.66 (max: 179 obs:14)	118.1 (max: 159 obs:4)

Table A2.2 Summary of Noranda EMP Soil Measurements (mg/kg(dry)) (Cont'd)

Location	1975-1984	1985-1999	Current
Soil 10	19 (max: 24 obs:7)	16.96 (max: 25 obs:14)	16.33 (max: 23 obs:3)
Soil 11	29.14 (max: 37 obs:7)	54.27 (max: 112 obs:13)	24.53 (max: 31.8 obs:4)
Soil 12	38.57 (max: 44 obs:7)	28.75 (max: 41 obs:14)	19.6 (max: 28 obs:4)
Soil 13	66.43 (max: 80 obs:7)	25.5 (max: 39 obs:14)	26.55 (max: 34.7 obs:4)
Soil 14	35.43 (max: 79 obs:7)	19.67 (max: 34 obs:14)	10.25 (max: 17 obs:4)
Soil 15	45.57 (max: 57 obs:7)	61.32 (max: 151 obs:14)	108 (max: 215 obs:4)
Soil 17	15.14 (max: 19 obs:7)	16.21 (max: 43 obs:14)	12.03 (max: 16.8 obs:5)
Soil 18	20.71 (max: 24 obs:7)	20 (max: 22 obs:2)	
Soil 19	76 (max: 271 obs:7)	34.88 (max: 48 obs:14)	35.72 (max: 47.3 obs:4)
Soil 2	64.43 (max: 95 obs:7)	52.55 (max: 135 obs:14)	40.13 (max: 63.3 obs:4)
Soil 20		27.06 (max: 41 obs:14)	24.78 (max: 27.5 obs:4)
Soil 21		52.55 (max: 105 obs:14)	46.72 (max: 77 obs:4)
Soil 22		5.3 (max: 8 obs:10)	2.938 (max: 3.25 obs:4)
Soil 3	149.4 (max: 290 obs:7)	229.2 (max: 924 obs:14)	105.9 (max: 221 obs:4)
Soil 4	51.14 (max: 77 obs:7)	44.85 (max: 100 obs:13)	29.35 (max: 32 obs:5)
Soil 5	45.57 (max: 67 obs:7)	33.8 (max: 52 obs:14)	32 (max: 40.8 obs:4)
Soil 6	39 (max: 57 obs:7)	23.59 (max: 32 obs:14)	14.85 (max: 23.5 obs:5)
Soil 7	21.57 (max: 27 obs:7)	12.87 (max: 19 obs:14)	10.56 (max: 13.5 obs:4)
Soil 8	42.57 (max: 51 obs:7)	34.48 (max: 99.5 obs:14)	39.7 (max: 83 obs:5)
Soil 9	25.43 (max: 34 obs:7)	64.25 (max: 276 obs:14)	256.6 (max: 625 obs:4)
Cadmium in Soil			
Garden A		1.5 (max: 2 obs:3)	
Garden C		1.771 (max: 3.33 obs:12)	1.964 (max: 2.25 obs:4)
Garden CC		0.85 (max: 2 obs:4)	
Garden D		1.54 (max: 1.58 obs:2)	1.624 (max: 2 obs:4)
Garden DD		0.482 (max: 0.5 obs:9)	0.5 (max: 0.5 obs:3)
Garden Dorig		1.167 (max: 1.5 obs:3)	
Garden E		1.279 (max: 2 obs:13)	
Garden EE1		0.485 (max: 0.5 obs:10)	0.5 (max: 0.5 obs:4)
Garden EE2		0.5 (max: 0.5 obs:3)	
Garden F		0.98 (max: 2 obs:5)	
Garden FF		0.42 (max: 0.5 obs:5)	
Garden G		1.244 (max: 3 obs:7)	
Garden GG1		0.583 (max: 0.75 obs:3)	
Garden GG2		0.543 (max: 0.67 obs:4)	0.52 (max: 0.58 obs:4)
Garden H1		0.5 (max: 0.5 obs:2)	0.5 (max: 0.5 obs:1)
Garden H2		0.5 (max: 0.5 obs:6)	
Garden HH1		0.96 (max: 1 obs:2)	
Garden HH2		0.999 (max: 1.42 obs:4)	
Garden I		0.623 (max: 1 obs:13)	0.5 (max: 0.5 obs:4)
Garden II		1.313 (max: 5 obs:14)	
Garden J		0.469 (max: 0.5 obs:13)	0.519 (max: 0.58 obs:4)
Garden KK		0.728 (max: 0.92 obs:4)	0.855 (max: 1 obs:4)
Garden MM		0.5 (max: 0.5 obs:5)	0.5 (max: 0.5 obs:2)
Garden N			0.5 (max: 0.5 obs:1)
Garden NN		0.583 (max: 0.67 obs:3)	
Garden O		0.909 (max: 1.83 obs:10)	
Garden P		0.479 (max: 0.5 obs:14)	0.5 (max: 0.5 obs:4)
Garden PP		0.639 (max: 0.92 obs:3)	0.5 (max: 0.5 obs:1)
Garden PP2		0.05 (max: 0.05 obs:1)	0.5 (max: 0.5 obs:1)
Garden QQ		0.5 (max: 0.5 obs:1)	
Garden T		0.568 (max: 0.67 obs:5)	0.5 (max: 0.5 obs:1)
Garden TT1		0.615 (max: 1.42 obs:8)	0.83 (max: 0.83 obs:1)
Garden TT2		1.33 (max: 1.33 obs:1)	

Table A2.2 Summary of Noranda EMP Soil Measurements (mg/kg(dry)) (Cont'd)

Location	1975-1984	1985-1999	Current
Garden U		1.083 (max: 1.5 obs:10)	
Garden W		0.516 (max: 0.62 obs:13)	0.5 (max: 0.5 obs:4)
Garden X		0.699 (max: 0.92 obs:3)	
Garden Y		0.716 (max: 1 obs:5)	
Soil 1	34.86 (max: 50 obs:7)	31.76 (max: 60.3 obs:14)	37.88 (max: 46 obs:4)
Soil 10	5.286 (max: 8 obs:7)	2.389 (max: 7 obs:14)	1.333 (max: 2.5 obs:3)
Soil 11	3.714 (max: 7 obs:7)	2.535 (max: 4 obs:13)	2.5 (max: 4.5 obs:4)
Soil 12	7 (max: 13 obs:7)	4.307 (max: 10 obs:14)	4.188 (max: 7.75 obs:4)
Soil 13	2.571 (max: 4 obs:7)	1.546 (max: 4 obs:14)	2.525 (max: 3.5 obs:4)
Soil 14	2.714 (max: 4 obs:7)	1.236 (max: 3 obs:14)	2.563 (max: 5.5 obs:4)
Soil 15	14.43 (max: 29 obs:7)	9.421 (max: 32 obs:14)	6.625 (max: 10.8 obs:4)
Soil 17	2.143 (max: 3 obs:7)	1.333 (max: 8.5 obs:14)	0.46 (max: 0.5 obs:5)
Soil 18	1.857 (max: 3 obs:7)	0.75 (max: 1 obs:2)	
Soil 19	19.14 (max: 59 obs:7)	6.246 (max: 13 obs:14)	6.188 (max: 8.25 obs:4)
Soil 2	27.57 (max: 43 obs:7)	20.93 (max: 48 obs:14)	19.31 (max: 29.5 obs:4)
Soil 20		1.086 (max: 2 obs:14)	0.793 (max: 1.17 obs:4)
Soil 21		2.304 (max: 5 obs:14)	1.563 (max: 3 obs:4)
Soil 22		0.7 (max: 1 obs:10)	0.563 (max: 0.75 obs:4)
Soil 3	68.5 (max: 195 obs:7)	45.11 (max: 103 obs:14)	32.56 (max: 50.5 obs:4)
Soil 4	8.143 (max: 12 obs:7)	6.465 (max: 14 obs:13)	3.04 (max: 4.7 obs:5)
Soil 5	15.29 (max: 25 obs:7)	8.35 (max: 15 obs:14)	8.063 (max: 12.5 obs:4)
Soil 6	3.714 (max: 6 obs:7)	1.968 (max: 4 obs:14)	1.22 (max: 2 obs:5)
Soil 7	2.714 (max: 4 obs:7)	1.207 (max: 2.5 obs:14)	0.625 (max: 1 obs:4)
Soil 8	4 (max: 6 obs:7)	3.407 (max: 5.5 obs:14)	7.24 (max: 15 obs:5)
Soil 9	2.571 (max: 4 obs:7)	3.036 (max: 11 obs:14)	13.06 (max: 32.5 obs:4)
Chromium in Soil			
Garden N			39 (max: 39 obs:1)
Soil 17			39 (max: 39 obs:1)
Soil 4			25 (max: 25 obs:1)
Soil 6			36 (max: 36 obs:1)
Soil 8			32 (max: 32 obs:1)
Dioxins and Furans in Soil			
Garden N			3E-4 (max: 0 obs:1)
Soil 17			0.001 (max: 0 obs:1)
Soil 4			6E-4 (max: 0 obs:1)
Soil 6			2E-4 (max: 0 obs:1)
Soil 8			3E-4 (max: 0 obs:1)
Fluoride in Soil			
Soil 1		105 (max: 120 obs:7)	
Soil 10		58.25 (max: 79 obs:8)	
Soil 11		60.98 (max: 88.9 obs:8)	
Soil 12		57.2 (max: 73.1 obs:8)	
Soil 13		93.35 (max: 125 obs:8)	
Soil 14		40.49 (max: 61.2 obs:7)	
Soil 15		205.2 (max: 331 obs:8)	
Soil 17		88 (max: 123 obs:8)	
Soil 19		75.68 (max: 103 obs:8)	
Soil 2		66.51 (max: 94.2 obs:8)	
Soil 20		40.01 (max: 49.1 obs:7)	
Soil 21		61.26 (max: 79 obs:8)	
Soil 22		22.8 (max: 30.3 obs:7)	
Soil 3		127.7 (max: 214 obs:8)	
Soil 4		105.8 (max: 142 obs:7)	
Soil 5		2769 (max: 9920 obs:8)	

Table A2.2 Summary of Noranda EMP Soil Measurements (mg/kg(dry)) (Cont'd)

Location	1975-1984	1985-1999	Current
Soil 6		88.31 (max: 195 obs:8)	
Soil 7		69.69 (max: 121 obs:8)	
Soil 8		54.71 (max: 86 obs:8)	
Soil 9		99.91 (max: 138 obs:7)	
Lead in Soil			
Garden A		149.3 (max: 168 obs:3)	
Garden C		130.7 (max: 198 obs:13)	134.7 (max: 141 obs:4)
Garden CC		34.38 (max: 45.8 obs:3)	
Garden D		105.8 (max: 107 obs:2)	97.63 (max: 112 obs:4)
Garden DD		34.17 (max: 43 obs:10)	29.43 (max: 35.8 obs:3)
Garden Dorig		80.29 (max: 96.7 obs:3)	
Garden E		115 (max: 153 obs:13)	
Garden EE1		35.94 (max: 61.7 obs:10)	27.5 (max: 29.2 obs:4)
Garden EE2		28.31 (max: 35.8 obs:3)	
Garden F		82.36 (max: 105 obs:5)	
Garden FF		31.19 (max: 39.2 obs:5)	
Garden G		117.4 (max: 143 obs:7)	
Garden GG1		38.62 (max: 47.5 obs:3)	
Garden GG2		43.96 (max: 53.3 obs:4)	36.45 (max: 38.3 obs:4)
Garden H1		35.42 (max: 38.3 obs:2)	35 (max: 35 obs:1)
Garden H2		43.39 (max: 60.8 obs:6)	
Garden HH1		53.3 (max: 60.8 obs:2)	
Garden HH2		78.56 (max: 128 obs:4)	
Garden I		69.79 (max: 100 obs:13)	42.9 (max: 53.3 obs:4)
Garden II		48.08 (max: 65.8 obs:14)	
Garden J		30.1 (max: 45 obs:13)	23.45 (max: 25.8 obs:4)
Garden KK		52.51 (max: 61.7 obs:4)	51.23 (max: 57.5 obs:4)
Garden MM		19.33 (max: 23.3 obs:5)	11.7 (max: 11.7 obs:2)
Garden N			37.5 (max: 37.5 obs:1)
Garden NN		78.33 (max: 100 obs:3)	
Garden O		60.74 (max: 76.5 obs:10)	
Garden P		49.43 (max: 68 obs:13)	37.7 (max: 41.7 obs:4)
Garden PP		57.7 (max: 101 obs:4)	20 (max: 20 obs:1)
Garden PP2		40 (max: 40 obs:1)	30 (max: 30 obs:1)
Garden QQ		65 (max: 65 obs:1)	
Garden T		42.84 (max: 57.5 obs:5)	30.8 (max: 30.8 obs:1)
Garden TT1		53.16 (max: 69.1 obs:8)	37.5 (max: 37.5 obs:1)
Garden TT2		65.8 (max: 65.8 obs:1)	
Garden U		62.35 (max: 103 obs:10)	
Garden W		37.44 (max: 59.1 obs:13)	24.9 (max: 30 obs:4)
Garden X		63.33 (max: 92.5 obs:3)	
Garden Y		64.5 (max: 84.2 obs:5)	
Soil 1	2043 (max: 3090 obs:7)	2042 (max: 5350 obs:14)	2838 (max: 3200 obs:4)
Soil 10	258.4 (max: 375 obs:7)	147.3 (max: 513 obs:14)	78.33 (max: 113 obs:3)
Soil 11	202 (max: 428 obs:7)	164.2 (max: 335 obs:14)	125 (max: 163 obs:4)
Soil 12	385.1 (max: 895 obs:7)	253.1 (max: 595 obs:14)	158.8 (max: 348 obs:4)
Soil 13	88.86 (max: 123 obs:7)	106.3 (max: 265 obs:14)	115.9 (max: 216 obs:4)
Soil 14	97.86 (max: 140 obs:7)	96.43 (max: 153 obs:14)	345 (max: 703 obs:4)
Soil 15	1363 (max: 2888 obs:7)	1174 (max: 3875 obs:14)	893.8 (max: 2200 obs:4)
Soil 17	136 (max: 205 obs:7)	111.6 (max: 415 obs:14)	35.02 (max: 37.9 obs:5)
Soil 18	72 (max: 100 obs:7)	71.5 (max: 100 obs:2)	

Table A2.2 Summary of Noranda EMP Soil Measurements (mg/kg(dry)) (Cont'd)

Location	1975-1984	1985-1999	Current
Soil 19	2181 (max: 11E3 obs:7)	315.1 (max: 830 obs:14)	361.3 (max: 558 obs:4)
Soil 2	2403 (max: 4200 obs:7)	1307 (max: 3825 obs:14)	668.1 (max: 1425 obs:4)
Soil 20		92.25 (max: 430 obs:14)	41.6 (max: 53.9 obs:4)
Soil 21		132.3 (max: 340 obs:14)	83.13 (max: 125 obs:4)
Soil 22		38.05 (max: 88 obs:10)	10.63 (max: 17.5 obs:4)
Soil 3	6620 (max: 12E3 obs:7)	4365 (max: 14E3 obs:14)	3370 (max: 8000 obs:4)
Soil 4	785.7 (max: 1123 obs:6)	1051 (max: 4063 obs:13)	442.4 (max: 902 obs:5)
Soil 5	1250 (max: 2248 obs:7)	587.5 (max: 1295 obs:14)	690.6 (max: 1525 obs:4)
Soil 6	164.7 (max: 241 obs:7)	128.3 (max: 213 obs:14)	76.16 (max: 103 obs:5)
Soil 7	113.1 (max: 258 obs:7)	72.43 (max: 143 obs:14)	30 (max: 32.5 obs:4)
Soil 8	259 (max: 300 obs:7)	231.7 (max: 380 obs:14)	543 (max: 1575 obs:5)
Soil 9	124.4 (max: 241 obs:7)	647.5 (max: 2925 obs:14)	3348 (max: 8000 obs:4)
Mercury in Soil			
Garden N			0.05 (max: 0.05 obs:1)
Soil 17			0.08 (max: 0.08 obs:1)
Soil 4			0.24 (max: 0.24 obs:1)
Soil 6			0.11 (max: 0.11 obs:1)
Soil 8			0.05 (max: 0.05 obs:1)
Thallium in Soil			
Garden C		0.85 (max: 1.6 obs:9)	1.01 (max: 1.13 obs:4)
Garden CC		0.5 (max: 0.5 obs:1)	
Garden D		0.865 (max: 0.93 obs:2)	0.878 (max: 1 obs:4)
Garden DD		0.358 (max: 0.57 obs:7)	0.52 (max: 0.6 obs:3)
Garden Dorig		0.678 (max: 0.9 obs:3)	
Garden E		0.895 (max: 1.23 obs:8)	
Garden EE1		0.386 (max: 0.8 obs:8)	0.538 (max: 0.7 obs:4)
Garden EE2		0.387 (max: 0.4 obs:3)	
Garden FF		0.177 (max: 0.23 obs:3)	
Garden G		0.515 (max: 0.53 obs:2)	
Garden GG1		0.4 (max: 0.6 obs:3)	
Garden GG2		0.416 (max: 0.53 obs:4)	0.673 (max: 1.3 obs:4)
Garden H1		0.4 (max: 0.5 obs:2)	0.53 (max: 0.53 obs:1)
Garden H2		0.494 (max: 0.53 obs:6)	
Garden HH1		0.65 (max: 0.7 obs:2)	
Garden HH2		2.333 (max: 7 obs:4)	
Garden I		0.415 (max: 0.6 obs:9)	0.423 (max: 0.53 obs:4)
Garden II		0.495 (max: 0.6 obs:14)	
Garden J		0.565 (max: 0.8 obs:8)	0.508 (max: 0.66 obs:4)
Garden KK		0.45 (max: 0.5 obs:4)	0.506 (max: 0.77 obs:4)
Garden MM		0.206 (max: 0.3 obs:5)	0.25 (max: 0.3 obs:2)
Garden N			0.2 (max: 0.2 obs:1)
Garden NN		0.533 (max: 0.7 obs:3)	
Garden O		0.947 (max: 1.73 obs:5)	
Garden P		0.469 (max: 0.6 obs:8)	0.382 (max: 0.47 obs:4)
Garden PP		0.458 (max: 0.6 obs:4)	0.6 (max: 0.6 obs:1)
Garden PP2		0.5 (max: 0.5 obs:1)	1.3 (max: 1.3 obs:1)
Garden QQ		0.533 (max: 0.53 obs:1)	
Garden T		0.418 (max: 0.5 obs:5)	0.6 (max: 0.6 obs:1)
Garden TT1		0.61 (max: 0.72 obs:7)	2 (max: 2 obs:1)
Garden TT2		0.7 (max: 0.7 obs:1)	
Garden U		0.586 (max: 1 obs:5)	
Garden W		0.462 (max: 0.7 obs:9)	0.535 (max: 0.7 obs:4)

Table A2.2 Summary of Noranda EMP Soil Measurements (mg/kg(dry)) (Cont'd)

Location	1975-1984	1985-1999	Current
Garden X		0.428 (max: 0.45 obs:3)	
Garden Y		0.492 (max: 0.6 obs:5)	
Soil 17			0.2 (max: 0.2 obs:1)
Soil 4			4.5 (max: 4.5 obs:1)
Soil 6			0.4 (max: 0.4 obs:1)
Soil 8			1.4 (max: 1.4 obs:1)
Zinc in Soil			
Garden A		163 (max: 180 obs:3)	
Garden C		159 (max: 211 obs:13)	187.8 (max: 197 obs:4)
Garden CC		67.83 (max: 78.5 obs:3)	
Garden D		169.5 (max: 208 obs:2)	190.2 (max: 218 obs:4)
Garden DD		101.8 (max: 114 obs:8)	105.8 (max: 129 obs:3)
Garden Dorig		121.1 (max: 139 obs:3)	
Garden E		151.7 (max: 235 obs:13)	
Garden EE1		111.7 (max: 131 obs:10)	108.9 (max: 136 obs:4)
Garden EE2		101.3 (max: 110 obs:3)	
Garden F		115 (max: 128 obs:5)	
Garden FF		27.58 (max: 32.3 obs:5)	
Garden G		144.3 (max: 160 obs:7)	
Garden GG1		136.6 (max: 141 obs:3)	
Garden GG2		173.7 (max: 183 obs:4)	173.9 (max: 181 obs:4)
Garden H1		87.55 (max: 93.1 obs:2)	86.8 (max: 86.8 obs:1)
Garden H2		86.8 (max: 89.6 obs:6)	
Garden HH1		102.8 (max: 105 obs:2)	
Garden HH2		110 (max: 116 obs:4)	
Garden I		224.1 (max: 253 obs:13)	204.6 (max: 226 obs:4)
Garden II		149.9 (max: 238 obs:14)	
Garden J		108.7 (max: 130 obs:13)	133.5 (max: 145 obs:4)
Garden KK		115.3 (max: 124 obs:4)	121.2 (max: 140 obs:4)
Garden MM		49.3 (max: 64.2 obs:5)	48.15 (max: 53.3 obs:2)
Garden N			156 (max: 156 obs:1)
Garden NN		225.7 (max: 280 obs:3)	
Garden O		114.2 (max: 129 obs:10)	
Garden P		136 (max: 181 obs:13)	162.3 (max: 175 obs:4)
Garden PP		142.2 (max: 180 obs:3)	96.3 (max: 96.3 obs:1)
Garden PP2		146.9 (max: 147 obs:1)	137.8 (max: 138 obs:1)
Garden QQ		75.83 (max: 76.8 obs:2)	
Garden T		76.33 (max: 82.4 obs:5)	74.1 (max: 74.1 obs:1)
Garden TT1		101.3 (max: 140 obs:7)	127.2 (max: 127 obs:1)
Garden TT2		116.9 (max: 117 obs:1)	
Garden U		92.57 (max: 140 obs:10)	
Garden W		173.7 (max: 212 obs:13)	147.4 (max: 150 obs:4)
Garden X		87.93 (max: 102 obs:3)	
Garden Y		82.33 (max: 88.6 obs:5)	
Soil 1	1175 (max: 1383 obs:7)	756.7 (max: 1600 obs:14)	1181 (max: 1350 obs:4)
Soil 10	203.9 (max: 288 obs:7)	120.3 (max: 223 obs:14)	105.5 (max: 113 obs:3)
Soil 11	180.3 (max: 364 obs:7)	161.2 (max: 263 obs:13)	146.4 (max: 160 obs:4)
Soil 12	288.6 (max: 625 obs:7)	205.9 (max: 313 obs:14)	197.5 (max: 258 obs:4)
Soil 13	142.4 (max: 221 obs:7)	126.3 (max: 200 obs:14)	163.3 (max: 266 obs:4)
Soil 14	154.6 (max: 226 obs:7)	187.6 (max: 288 obs:14)	414.7 (max: 815 obs:4)
Soil 15	857.3 (max: 1550 obs:7)	742.2 (max: 2138 obs:14)	484.4 (max: 713 obs:4)
Soil 17	194.4 (max: 322 obs:7)	176.1 (max: 330 obs:14)	118.7 (max: 140 obs:5)

Table A2.2 Summary of Noranda EMP Soil Measurements (mg/kg(dry)) (Cont'd)

Location	1975-1984	1985-1999	Current
Soil 18	95.86 (max: 125 obs:7)	100.5 (max: 103 obs:2)	
Soil 19	691.3 (max: 1928 obs:7)	221.6 (max: 420 obs:14)	241.9 (max: 298 obs:4)
Soil 2	1187 (max: 2300 obs:7)	682.2 (max: 1085 obs:13)	606.3 (max: 795 obs:4)
Soil 20		103 (max: 130 obs:14)	90.03 (max: 95 obs:4)
Soil 21		138.5 (max: 283 obs:14)	107.7 (max: 138 obs:4)
Soil 22		30.86 (max: 53 obs:10)	22.25 (max: 33.5 obs:4)
Soil 3	2340 (max: 5175 obs:7)	3256 (max: 34E3 obs:14)	660 (max: 915 obs:4)
Soil 4	877.2 (max: 1175 obs:6)	1278 (max: 7275 obs:13)	751.3 (max: 1900 obs:5)
Soil 5	641 (max: 850 obs:7)	284.4 (max: 428 obs:14)	345.6 (max: 643 obs:4)
Soil 6	164.6 (max: 197 obs:7)	119.7 (max: 165 obs:14)	97.06 (max: 121 obs:5)
Soil 7	124.4 (max: 217 obs:7)	193.1 (max: 415 obs:14)	104.1 (max: 120 obs:4)
Soil 8	230.9 (max: 248 obs:7)	174.8 (max: 225 obs:14)	251.7 (max: 443 obs:5)
Soil 9	172 (max: 365 obs:7)	226.3 (max: 420 obs:14)	584.4 (max: 1250 obs:4)

Soil data were also available from a number of other sources (JWEL, 2003; CCNBa,b; GEMTEC, 2004; MacMillan, 1987 and unknown; Loro, 1998). Table A2.3 shows the COPC soil concentrations measured outside the industrial area grouped by the organization collecting the data.

Table A2.3 Summary of Soil Measurements from Other Monitoring Programs (mg/kg(dry))

Location	DataID	Year	Arsenic	Cadmium	Chromium	Lead	Mercury	Thallium	Zinc	Area
Bennett Baseline										
Control		2003	5	0.3	9	31		0.3	42	Belledune
MPOI #2		2003	12	3.3	20	190		1	130	Townsite
CCNB										
2.5 km east	B075102	2004	49	2.9	38	217	0.18	1.16	332	LowerBelledune
2.5 km east	B075103	2004	50	4.6	40	377	0.45	1.54	504	LowerBelledune
2.5 km east	B075104	2004	34	2.9	38	233	0.09	1.46	195	LowerBelledune
2.5 km east	B075105	2004	65	2.9	45	170	0.17	1.59	248	LowerBelledune
2.5 km east	B075106	2004	44	9.1	37	688	0.17	3.33	446	LowerBelledune
2.5 km east	B075120	2004	40	2.6	66	164	0.06	1.28	185	LowerBelledune
2.5 km east	B075121	2004	40	2.7	71	134	0.07	1.16	164	LowerBelledune
3 km west	B075118	2004	21	4.4	36	247	0.12	1.85	201	Townsite
3 km west	B075119	2004	23	5.3	37	303	0.12	2.66	233	Townsite
4.5 km west	B075108	2004	29	1.9	50	118	0.13	1.13	152	Belledune
4.5 km west	B075109	2004	47	1.5	39	87	0.07	1.14	123	Belledune
4.5 km west	B075110	2004	21	1.4	37	79	0.11	1.12	127	Belledune
4.5 km west	B075111	2004	13	4.1	19	278	0.16	2.45	138	Belledune
5.75 km west	B075114	2004	24	6	35	413	0.12	2.69	190	Belledune
5.75 km west	B075115	2004	78	12.4	34	2800	0.12	2.97	1055	Belledune
5.75 km west	B075116	2004	34	0.25	47	54	0.07	0.65	91	Belledune
5.75 km west	B075117	2004	19	2.2	40	134	0.07	1.52	107	Belledune
6 km west	B075112	2004	15	2.1	24	69	0.1	0.72	343	Belledune
6 km west	B075113	2004	18	3.8	36	158	0.1	1.7	134	Belledune
8.5 km west	B075107	2004	18	0.5	36	41	0.07	0.64	96	Belledune
Area Near Mail B	B075084	2003	40	4.4	49	454			439	LowerBelledune
Belle Point Park	B075051	2003	35	1.2	41	74			128	Belledune
Belle Point Park	B075052	2003	17	0.5	38	38			68	Belledune
Belle Point Park	B075053	2003	20	0.7	38	58			100	Belledune
Belle Point Park	B075068	2003	41	0.8	45	45			105	Belledune
Belle Point Park	B075070	2003	3	0.6	11	36			54	Belledune
Belledune School	B075054	2003	26	1.4	39	131			90	Belledune
Belledune School	B075055	2003	29	2.7	38	155			110	Belledune

Table A2.3 Summary of Soil Measurements from Other Monitoring Programs (mg/kg(dry)) (Cont'd)

Location	DataID	Year	Arsenic	Cadmium	Chromium	Lead	Mercury	Thallium	Zinc	Area
Belledune School	B075071	2003	59	6.3	39	1745	-	-	695	Belledune
Belledune School	B075072	2003	23	1.6	39	94	-	-	132	Belledune
Jacquet River Sc	B075074	2003	14	0.8	50	94	-	-	178	Belledune
Jacquet River Sc	B075075	2003	30	0.8	32	43	-	-	167	Belledune
Jacquet River Sc	B075076	2003	22	1.9	32	84	-	-	241	Belledune
Jacquet River Sc	B075077	2003	16	0.9	36	52	-	-	164	Belledune
Little Belledune	B075056	2003	21	5.4	36	353	-	-	176	Belledune
Little Belledune	B075078	2003	30	8.9	32	911	-	-	281	Belledune
Old Belledune Wh	B075073	2003	10	0.7	31	44	-	-	84	Belledune
Pelle Point Park	B075069	2003	15	0.6	13	25	-	-	52	Belledune
Petit-Rocher Ele	B075065	2003	13	0.25	75	53	2	-	110	Petit-Rocher
Petit-Rocher Ele	B075066	2003	7	0.25	47	45	-	-	78	Petit-Rocher
Petit-Rocher Ele	B075089	2003	9	0.25	63	36	-	-	98	Petit-Rocher
Petit-Rocher Ele	B075090	2003	30	0.25	31	34	-	-	77	Petit-Rocher
Point Verte - Ba	B075061	2003	22	0.6	34	47	-	-	100	Pointe-Verte
Point Verte - Ba	B075062	2003	14	0.25	28	31	-	-	72	Pointe-Verte
Point Verte - Ne	B075067	2003	18	1.6	60	78	-	-	128	Pointe-Verte
Point Verte Scho	B075063	2003	16	0.6	58	38	-	-	95	Pointe-Verte
Point Verte Scho	B075064	2003	24	1.6	62	90	2	-	140	Pointe-Verte
Pointe-Verte Bal	B075086	2003	23	0.8	26	94	-	-	116	Pointe-Verte
Pointe-Verte Bal	B075087	2003	2	0.5	15	24	-	-	58	Pointe-Verte
Pointe-Verte Ele	B075088	2003	34	1.1	78	82	-	-	122	Pointe-Verte
Pointe-Verte Vil	B075085	2003	54	3.2	45	1095	-	-	675	Pointe-Verte
Townsite #2 - Ba	B075059	2003	30	2.5	68	211	-	-	134	Townsite
Townsite #2 - Ba	B075082	2003	42	3.1	59	534	-	-	261	Townsite
West of Pointe-V	B075091	2003	17	1	46	57	-	-	100	Pointe-Verte
West of Pointe-V	B075092	2003	23	1.4	45	105	-	-	182	Pointe-Verte
West of Pointe-V	B075093	2003	40	1.3	43	126	-	-	165	Pointe-Verte
West of Pointe-V	B075095	2003	66	0.9	100	249	-	-	487	LowerBelledune

Table A2.3 Summary of Soil Measurements from Other Monitoring Programs (mg/kg(dry)) (Cont'd)

Location	DataID	Year	Arsenic	Cadmium	Chromium	Lead	Mercury	Thallium	Zinc	Area
					GEMTEC					
Belledune School Playground	GEMBSCXA	2003	11	0.8	32	42.3		0.4	66	Belledune
Belledune School Playground	GEMBSCXB	2003	11	2	32	106		0.7	109	Belledune
Belledune School Playground	GEMBSCXC	2003	12	1	31	52.2		0.4	69	Belledune
Belledune School Playground	GEMBSCXD	2003	12	1	35	55.2		0.4	73	Belledune
Belledune School Playground	GEMBSCXE	2003	11	0.9	34	46.7		0.5	73	Belledune
Belledune School Playground	GEMBSCXF	2003	12	0.8	36	44.4		0.4	72	Belledune
Belledune School Playground	GEMBSCXG	2003	13	1.4	34	74.7		0.5	82	Belledune
Belledune School Playpit	GEMBSC7S2	2003	10	1.6	31	70.4		0.5	125	Belledune
Belledune School Playpit	GEMBSC8S1	2003	14	1.7	35	158		0.7	132	Belledune
Belledune School Playpit	GEMBSC9S1	2003	24	1.4	19	501		0.3	231	Belledune
Pointe-Verte Bus	GEMPVBSS1	2003	55	5.1	63	1760		3	1130	Pointe-Verte
Pointe-Verte Bus	GEMPVBSS2	2003	45	5.5	68	2010		3	1200	Pointe-Verte
Pointe-Verte Bus	GEMPVBSS3	2003	51	3.4	56	1420		2.7	564	Pointe-Verte
Pointe-Verte Bus	GEMPVBSS4	2003	28	2.1	66	778		1.4	376	Pointe-Verte
Pointe-Verte Bus	GEMPVBSS5	2003	32	4.7	81	1230		1.5	478	Pointe-Verte
Pointe-Verte Bus	GEMPVBSS6	2003	38	3.9	61	1300		2.2	501	Pointe-Verte
Roherty Sand	GEMRBS1	2003	4	0.05	19	7.3		0.05	31	Belledune
Roherty Sand	GEMRBS2	2003	5	0.2	30	20.8		0.1	65	Belledune
Roherty Sand	GEMRBS3	2003	4	0.05	20	10		0.05	33	Belledune
Roherty Soil	GEMRBS4	2003	6	1.6	16	92.4		0.5	60	Belledune
Roherty Soil	GEMRBS5	2003	5	1	19	334		0.6	72	Belledune
Roherty Soil	GEMRBS6	2003	6	0.2	22	24		0.2	45	Belledune
Roherty Soil	GEMRBS7	2003	4	1.5	12	83.2		0.3	213	Belledune
Townsite Ball Diamond	GEMTBFXA	2003	15	2.2	37	215		0.8	166	Townsite
Townsite Ball Diamond	GEMTBFXB	2003	16	2.6	37	214		1	144	Townsite
Townsite Ball Diamond	GEMTBFXC	2003	14	2.4	38	153		0.7	161	Townsite
Townsite Ball Diamond	GEMTBFXD	2003	18	2.8	41	162		0.8	165	Townsite
Townsite Ball Diamond	GEMTBFXE	2003	12	2.1	43	111		0.6	114	Townsite
Townsite Ball Diamond	GEMTBFXF	2003	14	2.3	38	160		0.8	142	Townsite
Townsite Ball Diamond	GEMTBFXG	2003	14	2.4	41	171		0.8	134	Townsite

Table A2.3 Summary of Soil Measurements from Other Monitoring Programs (mg/kg(dry)) (Cont'd)

Location	DataID	Year	Arsenic	Cadmium	Chromium	Lead	Mercury	Thallium	Zinc	Area
Townsite monitor	GEMDMS 1	2003	29	3.6	48	404	.	1.3	626	Townsite
Townsite monitor	GEMDMS 2	2003	47	7.6	48	2210	.	2.3	5320	Townsite
MacMillan										
1		1984	12.8	0.1	.	39	.	.	85.5	
10		1984	11.8	0.2	.	39	.	.	144	
11		1984	5	0.05	.	34	.	.	79.8	
12		1984	14.3	0.05	.	10.6	.	.	58.7	
13		1984	34.9	0.05	.	19	.	.	82.2	
14		1984	6.4	0.05	.	18	.	.	63.5	
15		1984	14.1	0.1	.	16	.	.	75.7	
16		1984	13.5	0.2	.	38	.	.	83	
17		1984	14.6	0.1	.	23	.	.	102	
18		1984	4.3	0.1	.	23	.	.	60	
19		1984	9.8	0.2	.	48	.	.	99	
2		1984	19.5	0.2	.	21	.	.	90.8	
20		1984	7	0.4	.	38	.	.	84	
21		1984	9.6	0.4	.	23	.	.	97	
22		1984	3.1	0.2	.	20	.	.	50	
23		1984	6.8	0.05	.	60	.	.	99	
24		1984	2.5	0.05	.	15	.	.	43	
25		1984	15.4	0.3	.	28	.	.	72	
26		1984	6.6	0.7	.	53	.	.	118	
27		1984	2.3	0.8	.	70	.	.	69	
28		1984	3	0.05	.	18	.	.	56	
29		1984	6.2	0.05	.	25	.	.	60.5	
3		1984	15.6	0.5	.	21	.	.	92.5	
30		1984	5.7	0.05	.	35	.	.	91.8	
31		1984	15.4	0.05	.	25	.	.	69.5	
32		1984	18.7	0.05	.	35	.	.	84.3	
33		1984	12.8	0.05	.	45	.	.	82.8	
34		1984	11.5	0.05	.	25	.	.	96	
35		1984	7.8	0.05	.	75	.	.	84.5	
36		1984	7	0.05	.	15	.	.	37.5	
37		1984	5.2	0.05	.	40	.	.	87.3	
38		1984	11.9	0.05	.	35	.	.	103	
39		1984	12.6	0.1	.	35	.	.	104	
4		1984	9.1	0.2	.	22	.	.	54.5	
40		1984	11.3	0.05	.	35	.	.	87	
5		1984	4.3	0.2	.	18	.	.	55	
6		1984	10.3	0.2	.	36	.	.	46	
7		1984	3.9	0.4	.	31	.	.	115	
8		1984	12	0.05	.	18	.	.	97	
9		1984	3.9	0.05		18	.	.	104	
Alcida		1966	.	.	87.5	11.5	.	.	80	
Alcida		1967	.	.	69.5	12.5	.	.	83	
Alcida		1975	.	.	75	14	.	.	110	
Alcida		1980	.	.	72.5	11.8	.	.	96	
Black Land		1967	.	.	94	8	.	.	90	
Black Land		1975	.	.	95	10.5	.	.	80.5	
Black Land		1980	.	.	100	17.6	.	.	27	
Canobie		1966	.	.	33	8	.	.	60	
Canobie		1967	.	.	34	9	.	.	46.5	
Canobie		1975	.	.	32.5	8.5	.	.	49	
Canobie		1980	.	.	40	14.5	.	.	45.5	
Culligans		1966	.	.	110	10.5	.	.	77.8	
Culligans		1967	.	.	115	10.5	.	.	91	
Culligans		1975	.	.	111	31.3	.	.	120	
Culligans		1980	.	.	107	29.9	.	.	115	
Dunlop		1966	.	.	80.5	11.5	.	.	110	

Table A2.3 Summary of Soil Measurements from Other Monitoring Programs (mg/kg(dry)) (Cont'd)

Location	DataID	Year	Arsenic	Cadmium	Chromium	Lead	Mercury	Thallium	Zinc	Area
Dunlop		1967	.	.	78.5	13	.	.	127.5	
Dunlop		1975	.	.	78	14	.	.	130	
Dunlop		1980	.	.	82.5	13	.	.	112.5	
Green Pointe		1966	.	.	119	11.5	.	.	77.8	
Green Pointe		1967	.	.	110	9.6	.	.	85	
Green Pointe		1975	.	.	122	25	.	.	227.5	
Green Pointe		1980	.	.	120	23.3	.	.	112.5	
Nash Creek		1967	.	.	62.5	19.6	.	.	145	Belledune
Nash Creek		1975	.	.	67.5	24	.	.	217.5	Belledune
Nash Creek		1980	.	.	62	30.6	.	.	295	Belledune
New Colony		1966	.	.	54	11.5	.	.	92	Belledune
New Colony		1967	.	.	57.5	8	.	.	56.5	Belledune
New Colony		1975	.	.	56.5	18	.	.	87.5	Belledune
New Colony		1980	.	.	70.5	16	.	.	112.5	Belledune
					NBAgr					
1		1996	6	0.18	48	13	0.052	.	73	
10		1996	38	0.18	49.2	15.2	0.047	.	77	
100		1996	27	0.31	57.3	24.4	0.04	.	123	Belledune
101		1996	12	0.64	37.5	24.5	0.1	.	142	Belledune
102		1996	11	0.11	42.3	19.5	0.07	.	48	
103		1996	29	0.42	43.7	25.2	0.03	.	122	
104		1996	14	0.17	48.2	24.9	0.05	.	99	
105		1996	5	0.11	35.3	13.2	0.03	.	56	
106		1996	4	0.05	11.6	6.4	0.04	.	21	
107		1996	6	0.11	14.8	13.6	0.06	.	35	
108		1996	5	0.06	12.8	10.7	0.02	.	28	
109		1996	3	0.07	17.5	6.4	0.03	.	.	
11		1996	7	0.15	53.8	13	0.041	.	69	
110		1996	2	0.03	17.5	7.9	0.03	.	.	
111		1996	5	0.22	96	14.5	0.05	.	87	
112		1996	6	0.17	63.5	14.5	0.05	.	95	
113		1996	6	0.18	69.5	14	0.05	.	82	
114		1996	5	0.23	48	89.3	0.07	.	111	
115		1996	2	0.05	2.2	5	0.03	.	25	
116		1996	12	0.06	20.3	10.3	0.05	.	46	
117		1996	6	0.18	27.7	15.2	0.03	.	42	
118		1996	21	0.18	38.6	12.1	0.04	.	84	
12		1996	12	0.12	48.1	14.5	0.052	.	77	
13		1996	6	0.13	25.4	15.4	0.034	.	64	
14		1996	16	0.42	20.9	34.8	0.032	.	64	
15		1996	16	0.13	19.6	20	0.048	.	70	
16		1996	12	0.16	30.1	26.2	0.059	.	64	
17		1996	7	0.11	23.5	27.3	0.044	.	57	
18		1996	4	0.09	12.2	13.5	0.031	.	30	
19		1996	7	0.19	24	16.5	0.04	.	65	
2		1996	12	0.14	40.2	14.9	0.049	.	74	
20		1996	12	0.14	35.1	12	0.062	.	66	
21		1996	7	0.18	18.2	11.9	0.026	.	54	
22		1996	8	0.19	24.9	19.3	0.045	.	62	
23		1996	3	0.05	15.4	8.4	0.025	.	31	
24		1996	4	0.1	27.6	11.1	0.027	.	56	
25		1996	4	0.06	11.7	8.6	0.028	.	25	
26		1996	4	0.12	21.4	12.3	0.029	.	56	
27		1996	4	0.12	17.9	12.8	0.052	.	46	
28		1996	8	0.12	19.6	17	0.047	.	52	
29		1996	13	0.11	12.5	17.3	0.052	.	37	
3		1996	9	0.15	52	14.8	0.054	.	86	
30		1996	6	0.14	24.6	16.7	0.05	.	67	
31		1996	10	0.09	15.5	19.7	0.08	.	53	
32		1996	2	0.07	19.9	16.6	0.041	.	44	

Table A2.3 Summary of Soil Measurements from Other Monitoring Programs (mg/kg(dry)) (Cont'd)

Location	DataID	Year	Arsenic	Cadmium	Chromium	Lead	Mercury	Thallium	Zinc	Area
33		1996	2	0.06	21.1	11.2	0.03	.	48	
34		1996	6	0.05	23.2	17.3	0.04	.	51	
35		1996	6	0.1	28.3	10.7	0.046	.	43	
36		1996	3	0.12	18.1	7.8	0.033	.	57	
37		1996	3	0.19	16.8	8.6	0.044	.	46	
38		1996	12	0.14	17	13.7	0.026	.	50	
39		1996	2	0.05	20.5	12	0.026	.	41	
4		1996	6	0.15	45.2	12.2	0.056	.	83	
40		1996	5	0.09	17	10.4	0.049	.	46	
41		1996	2	0.05	17.6	9.8	0.03	.	34	
42		1996	3	0.13	16.6	14.6	0.056	.	48	
43		1996	4	0.15	14.3	17.4	0.054	.	53	
44		1996	6	0.36	20.7	13.9	0.044	.	56	
45		1996	4	0.17	21.2	16.6	0.036	.	74	
46		1996	14	0.19	42.7	15.8	0.05	.	81	
47		1996	12	0.19	25.6	16.2	0.07	.	84	
48		1996	15	0.13	27	15	0.09	.	58	
49		1996	8	0.12	28	19.4	0.07	.	69	
5		1996	19	0.23	44.7	16.8	0.044	.	98	
50		1996	10	0.18	32.5	14.2	0.05	.	76	
51		1996	15	0.17	35.3	33.1	0.08	.	84	
52		1996	10	0.16	18.8	13.2	0.05	.	64	
53		1996	4	0.12	13.7	9.7	0.05	.	37	
54		1996	5	0.14	11	9.7	0.06	.	55	
55		1996	4	0.05	14.7	5	0.04	.	29	
56		1996	7	0.2	39.7	15.4	0.04	.	75	
57		1996	6	0.08	28.3	15.4	0.07	.	59	
58		1996	9	0.14	23.5	14.1	0.04	.	62	
59		1996	9	0.19	26.8	43	0.07	.	73	
6		1996	18	0.18	42.2	11	0.05	.	79	
60		1996	10	0.17	23	14.1	0.04	.	61	
61		1996	3	0.08	19.3	9.4	0.05	.	45	
62		1996	8	0.12	31.7	14.7	0.06	.	56	
63		1996	6	0.14	33.8	13.3	0.05	.	70	
64		1996	8	0.15	33.4	14.8	0.07	.	75	
65		1996	6	0.14	25.5	12.6	0.07	.	67	
66		1996	13	0.08	26.8	10.1	0.07	.	48	
67		1996	10	0.14	25	14.8	0.06	.	68	
68		1996	15	0.2	37.9	37.7	0.1	.	110	
69		1996	27	0.11	24.6	11.2	0.05	.	59	
7		1996	14	0.14	41	12.8	0.049	.	74	
70		1996	58	0.16	24.1	17.8	0.06	.	60	
71		1996	6	0.12	19.2	16.7	0.06	.	50	
72		1996	7	0.07	12.2	9.3	0.06	.	26	
73		1996	8	0.08	19	11.6	0.05	.	40	
74		1996	6	0.07	20.1	10.3	0.05	.	37	
75		1996	5	0.23	38.6	13.5	0.04	.	78	
76		1996	10	0.15	63.7	15.2	0.06	.	79	
77		1996	8	0.12	36.6	14.6	0.06	.	62	
78		1996	7	0.09	33.2	9.8	0.03	.	62	
79		1996	11	0.12	35.1	13.7	0.05	.	70	
8		1996	16	0.16	40.9	10.4	0.045	.	74	
80		1996	19	0.14	44.3	21.1	0.06	.	80	
81		1996	11	0.17	42.2	17	0.05	.	94	
82		1996	17	0.13	37.7	14.9	0.06	.	64	
83		1996	26	0.16	46.2	14.9	0.06	.	82	
84		1996	55	0.15	47.2	14.9	0.05	.	94	
85		1996	21	0.15	34.1	14.5	0.05	.	71	
86		1996	12	0.19	32.8	17.6	0.06	.	75	
87		1996	11	0.13	18.5	17.9	0.06	.	62	
88		1996	7	0.12	32.3	15.3	0.04	.	67	

Table A2.3 Summary of Soil Measurements from Other Monitoring Programs (mg/kg(dry)) (Cont'd)

Location	DataID	Year	Arsenic	Cadmium	Chromium	Lead	Mercury	Thallium	Zinc	Area
89		1996	5	0.26	18.5	13.3	0.03	.	48	
9		1996	8	0.12	50.3	14.3	0.045	.	76	
90		1996	7	0.13	22.2	30.9	0.06	.	51	
91		1996	6	0.06	23.8	10.7	0.04	.	50	
92		1996	4	0.06	23.5	6.4	0.02	.	49	
93		1996	10	0.05	19.3	29.6	0.03	.	55	
94		1996	6	0.05	17.2	11.7	0.02	.	29	
95		1996	4	0.06	20.5	6.3	0.03	.	59	
96		1996	10	0.05	26.5	14.2	0.06	.	38	
97		1996	4	0.2	44.8	11.4	0.05	.	87	
97-01-11		1997	4.6	0.11	43	12.8	0.05	0.16	60	
97-02-11		1997	6.6	0.1	35	15.4	0.09	0.13	42	
97-03-11		1997	4.9	0.15	46	13.6	0.08	0.15	89	
97-04-03		1997	4.3	0.1	36	12.4	0.09	0.13	42	
97-05-03		1997	4.7	0.09	53	13.2	0.08	0.16	53	
97-06-04		1997	4.6	0.08	37	11	0.06	0.15	43	
97-07-12		1997	3.7	0.08	40	14.5	0.06	0.15	45	
97-08-13		1997	3.6	0.18	91	17	0.1	0.24	56	
97-09-05		1997	5.2	0.13	87	16.5	0.05	0.17	100	
97-10-06		1997	5.2	0.24	55	14.4	0.07	0.2	95	
97-11-06		1997	5.1	0.14	46	11.7	0.08	0.18	70	
97-12-07		1997	3.4	0.55	26	11.5	0.05	0.09	105	
97-13-08		1997	12.1	0.18	40	16.6	0.12	0.24	65	
97-14-16		1997	15.6	0.33	38	24.9	0.05	0.18	97	
97-15-15		1997	12.4	0.36	35	16.5	0.05	0.16	112	
97-16-15		1997	14	0.19	54	16.9	0.07	0.16	79	
97-17-14		1997	3.8	0.1	39	12.6	0.06	0.16	62	
97-18-13		1997	4.4	0.15	73	12.5	0.07	0.15	94	
97-19-35		1997	10.9	0.11	18	18.6	0.04	0.15	33	
97-20-34		1997	21	0.15	29	23.5	0.08	0.2	65	
97-21-34		1997	14.5	0.09	24	15.9	0.04	0.19	31	
97-22-24		1997	11.2	0.08	37	18.2	0.08	0.2	92	
97-23-25		1997	11.3	0.07	35	12.6	0.06	0.16	59	
97-24-25		1997	16.1	0.12	23	23.2	0.05	0.29	81	
97-25-26		1997	6.5	0.05	24	13.1	0.05	0.16	23	
97-26-26		1997	13.5	0.2	18	30.2	0.06	0.26	90	
97-27-24		1997	5.9	0.09	46	14.7	0.06	0.23	58	
97-28-17		1997	3.1	0.15	14	9	0.05	0.16	46	
97-29-27		1997	1.8	0.025	5	6.1	0.02	0.1	8	
97-30-27		1997	0.8	0.06	2	4.1	0.03	0.025	10	
97-31-42		1997	5.7	0.06	27	12.9	0.09	0.18	40	
97-32-41		1997	2.4	0.19	19	10.8	0.06	0.17	60	
97-33-41		1997	10.5	0.12	11	14	0.08	0.1	30	
97-34-40		1997	3.2	0.09	20	11.7	0.06	0.15	36	
97-35-40		1997	1.7	0.14	49	10.1	0.1	0.09	57	
97-36-39		1997	5.1	0.13	32	14.9	0.08	0.1	38	
97-37-70		1997	5.4	0.11	24	11.6	0.05	0.18	62	
97-38-77		1997	8.5	0.07	35	13.4	0.06	0.16	50	
97-39-77		1997	9.4	0.11	31	17.6	0.05	0.28	68	
97-40-76		1997	7.1	0.13	31	14.5	0.06	0.22	57	
97-41-69		1997	9.1	0.14	52	16.2	0.11	0.2	63	
97-42-68		1997	5.1	0.1	21	12.6	0.08	0.21	45	
97-43-22		1997	5.2	0.16	86	13.9	0.05	0.15	81	
97-44-23		1997	4.5	0.15	80	14.8	0.07	0.15	77	
97-45-23		1997	5.1	0.12	69	13	0.08	0.16	83	
97-46-33		1997	1.2	0.06	5	6.9	0.02	0.09	24	
97-47-33		1997	1.2	0.025	13	6.3	0.02	0.08	15	
97-48-40		1997	3.2	0.025	7	85.5	0.03	0.14	58	
97-49-49		1997	9.4	0.18	18	15	0.08	0.22	50	
97-50-49		1997	3.5	0.35	41	7.6	0.05	0.13	27	
97-51-48		1997	1.7	0.07	23	6.6	0.05	0.08	21	

Table A2.3 Summary of Soil Measurements from Other Monitoring Programs (mg/kg(dry)) (Cont'd)

Location	DataID	Year	Arsenic	Cadmium	Chromium	Lead	Mercury	Thallium	Zinc	Area
97-52-48		1997	12.5	0.025	9	12.7	0.09	0.2	53	
97-53-47		1997	87	0.025	13	16.3	0.06	0.16	116	
97-54-55		1997	5.6	0.025	17	7.9	0.05	0.11	37	
97-55-55		1997	4.7	0.025	0.5	4.3	0.04	0.08	12	
97-56-56		1997	4.9	0.07	9	8	0.04	0.1	26	
97-57-56		1997	.	0.06	19	10	0.05	0.15	46	
97-58-92		1997	0.8	0.12	23	4.9	0.02	0.025	7	
97-59-91		1997	3.9	0.11	24	9.3	0.04	0.1	12	
97-60-90		1997	5.4	0.28	23	13.2	0.07	0.17	26	
97-61-89		1997	12.1	0.11	19	30.6	0.06	0.15	54	
97-62-84		1997	10.2	0.025	5	12.3	0.04	0.07	37	
97-63-84		1997	13.6	0.28	23	16.2	0.06	0.18	90	
97-64-85		1997	13.2	0.11	19	12.7	0.03	0.16	38	
98		1996	3	0.2	55.3	12.7	0.04	.	77	
99		1996	5	0.22	46.2	14.9	0.04	.	66	

A2.2 Relationship between Measured Soil Concentrations and Predicted Air Concentrations

Site-specific relationships between measured soil concentration and predicted air concentration were developed.

Table A2.4 shows the predicted air concentrations used in the relationships between measured soil locations. The HHRA is based on exposures from airborne deposition in residential areas; therefore, monitoring locations from the industrial area have been excluded. Furthermore, some monitoring measurements from outside the industrial area are anomalously high with some evidence of contamination by other than airborne deposition. These soil concentrations have been identified and treated separately in the HHRA.

Table A2.4 Predicted Air Concentrations (µg/m³) and Measured Soil Concentrations (mg/kg) Used to Develop Relationship

Location	Media	Arsenic	Cadmium	Chromium	Dioxins and Furans	Lead	Mercury	Thallium	Zinc
Noranda Current									
Garden C	Air	0.00831	0.00347	.	.	0.17889	.	0.002	0.01064
Garden C	Soil	24.4875	1.964	.	.	134.725	.	1.01	187.775
Garden D	Air	0.00901	0.00304	.	.	0.1573	.	0.00186	0.02178
Garden D	Soil	17.045	1.624	.	.	97.625	.	0.8775	190.175
Garden GG2	Air	0.0005	0.00019	.	.	0.01004	.	0.00011	0.00061
Garden GG2	Soil	13.7325	0.4575	.	.	36.45	.	0.6725	173.9
Garden J	Air	0.00037	0.00013	.	.	0.0072	.	0.00007	0.00041
Garden J	Soil	13.0825	0.3315	.	.	23.45	.	0.50775	133.475
Garden KK	Air	0.00217	0.00077	.	.	0.04244	.	0.00044	0.00235
Garden KK	Soil	17.9	0.855	.	.	51.225	.	0.50625	121.225
Garden N	Air	0.00029	0.00009	0.00004	666E-14	0.00508	7.88E-6	0.00005	0.00028
Garden N	Soil	10	0.5	39	0.0003	37.5	0.05	0.2	156
Garden P	Air	0.00173	0.00064	.	.	0.034	.	0.00037	0.00227
Garden P	Soil	13.2075	0.375	.	.	37.7	.	0.382	162.25
Garden PP	Air	0.00173	0.00064	.	.	0.034	.	0.00037	0.00227
Garden PP	Soil	4.88	0.25	.	.	20	.	0.6	96.3
Garden PP2	Air	0.00173	0.00064	.	.	0.034	.	0.00037	0.00227
Garden PP2	Soil	11.38	0.5	.	.	30	.	1.3	137.8
Garden W	Air	0.00082	0.00031	.	.	0.01678	.	0.00018	0.00106
Garden W	Soil	13.3275	0.375	.	.	24.9	.	0.535	147.375
Soil 11	Air	0.00831	0.00347	.	.	0.17889	.	.	0.01064
Soil 11	Soil	24.5325	2.5	.	.	125	.	.	146.375
Soil 17	Air	0.00062	0.00023	0.00013	103E-13	0.01231	0.00002	0.00013	0.00077
Soil 17	Soil	12.028	0.31	39	0.001	35.02	0.08	0.2	118.66
Soil 20	Air	0.00233	0.00085	.	.	0.04618	.	.	0.00269
Soil 20	Soil	24.7775	0.7925	.	.	41.6	.	.	90.025
Soil 21	Air	0.00624	0.00241	.	.	0.12979	.	.	0.00727
Soil 21	Soil	46.72	1.5625	.	.	83.125	.	.	107.7
Soil 6	Air	0.00812	0.00278	0.00779	108E-12	0.14415	0.00022	0.00171	0.01934
Soil 6	Soil	14.85	1.22	36	0.0002	76.16	0.11	0.4	97.06
Soil 7	Air	0.00225	0.00083	.	.	0.04443	.	.	0.00299
Soil 7	Soil	10.5625	0.5625	.	.	30	.	.	104.1
Soil 8	Air	0.00989	0.00407	0.00127	175E-12	0.21148	0.00028	0.00233	0.01227
Soil 8	Soil	39.7	7.24	32	0.0003	543	0.05	1.4	251.7
Noranda 1985-1999									
Garden C	Air	0.01751	0.01652	.	.	0.58656	.	.	.
Garden C	Soil	34.389	1.77056	.	.	130.708	.	.	.
Garden D	Air	0.01605	0.01361	.	.	0.4945	.	.	.
Garden D	Soil	20.435	1.54	.	.	105.835	.	.	.
Garden E	Air	0.01704	0.01432	.	.	0.52018	.	.	.
Garden E	Soil	25.5062	1.27946	.	.	114.951	.	.	.
Garden F	Air	0.0126	0.01045	.	.	0.38554	.	.	.
Garden F	Soil	36.08	0.93	.	.	82.36	.	.	.
Garden G	Air	0.00428	0.00345	.	.	0.13088	.	.	.
Garden G	Soil	22.0371	1.24429	.	.	117.447	.	.	.

Table A2.4 Predicted Air Concentrations ($\mu g/m^3$) and Measured Soil Concentrations (mg/kg) Used to Develop Relationship (Cont'd)

Location	Media	Arsenic	Cadmium	Chromium	Dioxins and Furans	Lead	Mercury	Thallium	Zinc
Garden GG1	Air	0.00104	0.00088	.	.	0.03285	.	.	.
Garden GG1	Soil	13.89	0.41667	.	.	38.6233	.	.	.
Garden GG2	Air	0.00104	0.00088	.	.	0.03285	.	.	.
Garden GG2	Soil	14.9175	0.48	.	.	43.96	.	.	.
Garden HH1	Air	0.00498	0.00424	.	.	0.15578	.	.	.
Garden HH1	Soil	20.125	0.96	.	.	53.3	.	.	.
Garden HH2	Air	0.00498	0.00424	.	.	0.15578	.	.	.
Garden HH2	Soil	25.4175	0.99917	.	.	78.5583	.	.	.
Garden J	Air	0.00079	0.00061	.	.	0.02359	.	.	.
Garden J	Soil	19.2697	0.37308	.	.	30.0977	.	.	.
Garden KK	Air	0.00459	0.00367	.	.	0.13921	.	.	.
Garden KK	Soil	24.39	0.665	.	.	52.51	.	.	.
Garden P	Air	0.00356	0.00301	.	.	0.11093	.	.	.
Garden P	Soil	14.119	0.44286	.	.	49.4344	.	.	.
Garden PP	Air	0.00356	0.00301	.	.	0.11093	.	.	.
Garden PP	Soil	23.7925	0.63889	.	.	57.7	.	.	.
Garden PP2	Air	0.00356	0.00301	.	.	0.11093	.	.	.
Garden PP2	Soil	18.08	0.025	.	.	40	.	.	.
Garden U	Air	0.00609	0.00514	.	.	0.19215	.	.	.
Garden U	Soil	28.7837	1.083	.	.	62.351	.	.	.
Garden W	Air	0.00171	0.00147	.	.	0.0548	.	.	.
Garden W	Soil	11.2331	0.41949	.	.	37.4426	.	.	.
Garden X	Air	0.00552	0.00457	.	.	0.17164	.	.	.
Garden X	Soil	21.0956	0.69889	.	.	63.3333	.	.	.
Garden Y	Air	0.00776	0.00676	.	.	0.25019	.	.	.
Garden Y	Soil	27.7147	0.716	.	.	64.4993	.	.	.
Soil 11	Air	0.01751	0.01652	.	.	0.58656	.	.	.
Soil 11	Soil	54.2731	2.53462	.	.	164.214	.	.	.
Soil 17	Air	0.00128	0.00108	.	.	0.04023	.	.	.
Soil 17	Soil	16.2129	1.31464	.	.	111.571	.	.	.
Soil 18	Air	0.00032	0.00023	.	.	0.00877	.	.	.
Soil 18	Soil	20	0.625	.	.	71.5	.	.	.
Soil 20	Air	0.00488	0.00404	.	.	0.15133	.	.	.
Soil 20	Soil	27.0607	1.08571	.	.	92.25	.	.	.
Soil 21	Air	0.01322	0.01147	.	.	0.42596	.	.	.
Soil 21	Soil	52.545	2.30357	.	.	132.25	.	.	.
Soil 6	Air	0.01465	0.01243	.	.	0.45255	.	.	.
Soil 6	Soil	23.5893	1.96786	.	.	128.321	.	.	.
Soil 7	Air	0.00464	0.00392	.	.	0.14489	.	.	.
Soil 7	Soil	12.8664	1.18929	.	.	72.4286	.	.	.
Soil 8	Air	0.0209	0.01935	.	.	0.69392	.	.	.
Soil 8	Soil	34.4807	3.40714	.	.	231.714	.	.	.

Table A2.4 Predicted Air Concentrations (µg/m³) and Measured Soil Concentrations (mg/kg) Used to Develop Relationship (Cont'd)

Noranda 1975-1984									
Soil 11	Air	0.03309	0.02309	.	.	1.31697	.	.	.
Soil 11	Soil	29.1429	3.71429	.	.	202	.	.	.
Soil 17	Air	0.00242	0.00151	.	.	0.09028	.	.	.
Soil 17	Soil	15.1429	2.14286	.	.	136	.	.	.
Soil 18	Air	0.0006	0.00032	.	.	0.0197	.	.	.
Soil 18	Soil	20.7143	1.85714	.	.	72	.	.	.
Soil 6	Air	0.02698	0.01731	.	.	1.01188	.	.	.
Soil 6	Soil	39	3.71429	.	.	164.714	.	.	.
Soil 7	Air	0.00873	0.00547	.	.	0.32512	.	.	.
Soil 7	Soil	21.5714	2.71429	.	.	113.143	.	.	.
Soil 8	Air	0.03951	0.02705	.	.	1.55812	.	.	.
Soil 8	Soil	42.5714	4	.	.	259	.	.	.
CCNB Current									
B075068	Air	0.00469	0.00169	0.00167	.	0.09014	.	.	0.00701
B075068	Soil	41	0.8	45	.	45	.	.	105
B075069	Air	0.00347	0.0013	0.002	.	0.06854	.	.	0.00661
B075069	Soil	15	0.6	13	.	25	.	.	52
B075070	Air	0.00474	0.00171	0.00169	.	0.09129	.	.	0.00711
B075070	Soil	3	0.6	11	.	36	.	.	54
B075073	Air	0.00288	0.00106	0.00082	.	0.05636	.	.	0.00399
B075073	Soil	10	0.7	31	.	44	.	.	84
B075075	Air	0.00125	0.00046	0.00025	.	0.02479	.	.	0.00155
B075075	Soil	30	0.8	32	.	43	.	.	167
B075076	Air	0.00125	0.00046	0.00025	.	0.0249	.	.	0.00156
B075076	Soil	22	1.9	32	.	84	.	.	241
B075077	Air	0.00125	0.00046	0.00025	.	0.0249	.	.	0.00156
B075077	Soil	16	0.9	36	.	52	.	.	164
B075082	Air	0.00827	0.00286	0.00672	.	0.14918	.	.	0.01797
B075082	Soil	42	3.1	59	.	534	.	.	261
B075083	Air	0.016	0.00645	0.00178	.	0.33511	.	.	0.01896
B075083	Soil	79	27.3	31	.	1625	.	.	490
B075086	Air	0.00179	0.00063	0.00021	.	0.03471	.	.	0.00192
B075086	Soil	23	0.8	26	.	94	.	.	116
B075087	Air	0.00178	0.00062	0.00021	.	0.03444	.	.	0.0019
B075087	Soil	2	0.5	15	.	24	.	.	58
B075088	Air	0.00155	0.00054	0.00019	.	0.02971	.	.	0.00165
B075088	Soil	34	1.1	78	.	82	.	.	122
B075089	Air	0.00028	0.00009	0.00004	.	0.00491	.	.	0.00027
B075089	Soil	9	0.25	63	.	36	.	.	98
B075090	Air	0.00028	0.00009	0.00004	.	0.00487	.	.	0.00027
B075090	Soil	30	0.25	31	.	34	.	.	77
B075091	Air	0.00251	0.00092	0.00027	.	0.05029	.	.	0.00277
B075091	Soil	17	1	46	.	57	.	.	100
B075092	Air	0.00317	0.00118	0.00035	.	0.06422	.	.	0.00354
B075092	Soil	23	1.4	45	.	105	.	.	182
B075093	Air	0.00293	0.0011	0.00042	.	0.05933	.	.	0.00345
B075093	Soil	40	1.3	43	.	126	.	.	165
B075095	Air	0.00658	0.00256	0.00074	.	0.13748	.	.	0.0077
B075095	Soil	66	0.9	100	.	249	.	.	487
B075102	Air	0.00875	0.00353	0.00109	.	0.18629	0.00026	0.00202	0.0107
B075102	Soil	49	2.9	38	.	217	0.18	1.16	332
B075103	Air	0.00746	0.00303	0.00101	.	0.15907	0.00022	0.00174	0.00927
B075103	Soil	50	4.6	40	.	377	0.45	1.54	504

Table A2.4 Predicted Air Concentrations (µg/m³) and Measured Soil Concentrations (mg/kg) Used to Develop Relationship (Cont'd)

B075104	Air	0.00753	0.00304	0.00099	.	0.16046	0.00022	0.00174	0.00929
B075104	Soil	34	2.9	38	.	233	0.09	1.46	195
B075105	Air	0.00606	0.00244	0.00085	.	0.12859	0.00018	0.0014	0.00753
B075105	Soil	65	2.9	45	.	170	0.17	1.59	248
B075106	Air	0.00957	0.00388	0.00118	.	0.20375	0.00028	0.00222	0.0117
B075106	Soil	44	9.1	37	.	688	0.17	3.33	446
B075107	Air	0.00242	0.0009	0.00065	.	0.0478	0.00007	0.00052	0.00328
B075107	Soil	18	0.5	36	.	41	0.07	0.64	96
B075108	Air	0.00576	0.00204	0.00239	.	0.10869	0.00016	0.0012	0.0091
B075108	Soil	29	1.9	50	.	118	0.13	1.13	152
B075109	Air	0.00617	0.0022	0.00294	.	0.11711	0.00018	0.0013	0.01038
B075109	Soil	47	1.5	39	.	87	0.07	1.14	123
B075110	Air	0.00548	0.00196	0.00226	.	0.10477	0.00016	0.00115	0.00866
B075110	Soil	21	1.4	37	.	79	0.11	1.12	127
B075111	Air	0.0058	0.00212	0.00282	.	0.11156	0.00017	0.00124	0.00992
B075111	Soil	13	4.1	19	.	278	0.16	2.45	138
B075112	Air	0.00396	0.00143	0.00133	.	0.07656	0.00012	0.00083	0.0058
B075112	Soil	15	2.1	24	.	69	0.1	0.72	343
B075113	Air	0.00399	0.00145	0.00128	.	0.0772	0.00012	0.00084	0.00576
B075113	Soil	18	3.8	36	.	158	0.1	1.7	134
B075118	Air	0.00828	0.00287	0.00382	.	0.15294	0.00023	0.0017	0.01379
B075118	Soil	21	4.4	36	.	247	0.12	1.85	201
B075119	Air	0.00788	0.00273	0.00457	.	0.14512	0.00022	0.00163	0.01448
B075119	Soil	23	5.3	37	.	303	0.12	2.66	233

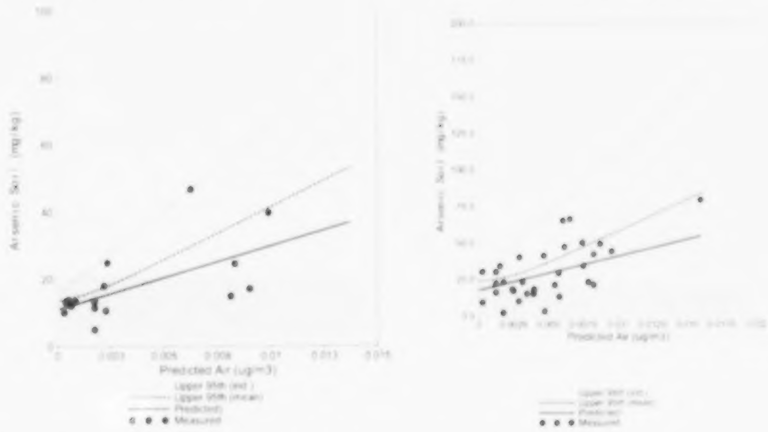
Relationship Fitting

Parameters for the empirical relationship were fit with weighted non-linear regression techniques using PROC NLIN in SAS software Version 8. The variance in estimated soil concentrations was modeled to increase with increasing air concentration therefore the weighting factor was set to the reciprocal of the square of the predicted air concentration plus 10% of the range of air concentrations (i.e. 1/(air conc+0.1*maximum air conc)^2). The Marquardt algorithm was used. Intercept and slope parameters were constrained to be positive.

The following figures show the relationships between measured soil concentration and predicted concentrations. Increasing soil concentration with increasing predicted air concentrations are typically present for most COPC with the exception of dioxins and furans and chromium.

Figure A6 Arsenic Relationships with Predicted Air Concentrations

a) Current with Noranda b) Current with CCNB



c) 1985-1999 with Noranda d) 1974-1984 with Noranda

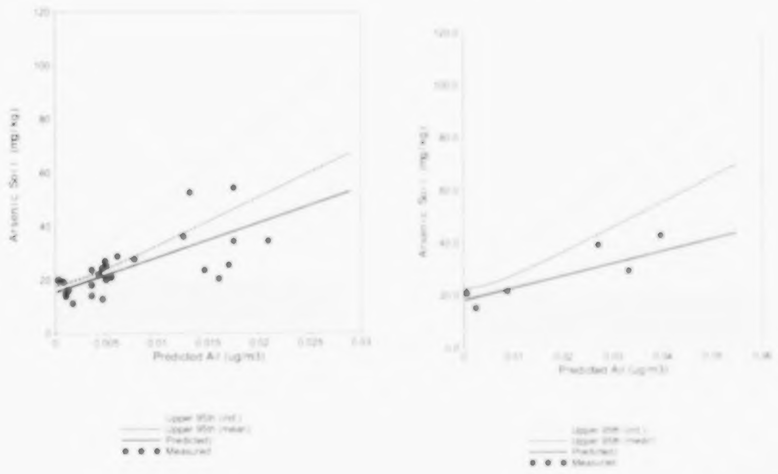
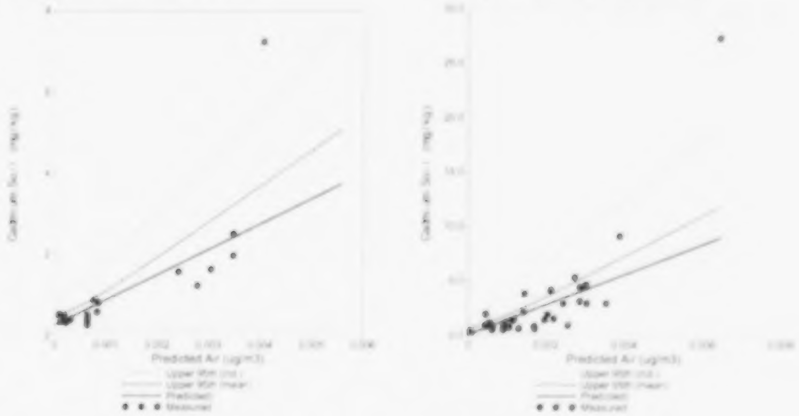


Figure A7 Cadmium Relationships with Predicted Air Concentrations

a) Current with Noranda b) Current with CCNB



c) 1985-1999 with Noranda d) 1974-1984 with Noranda

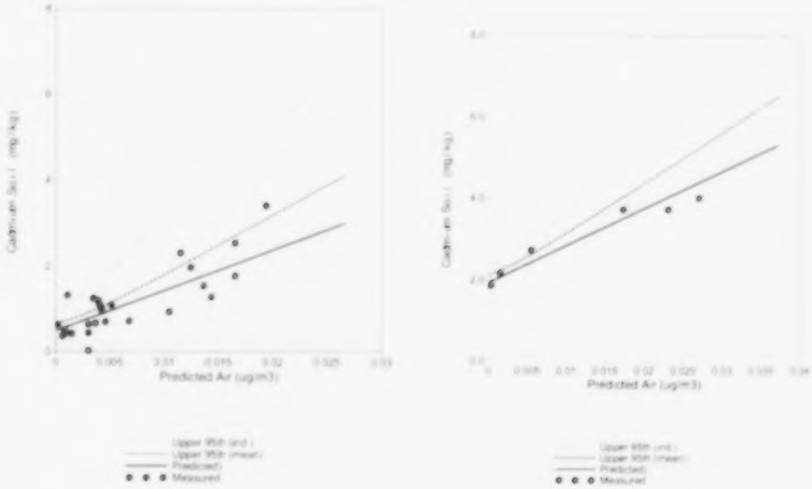
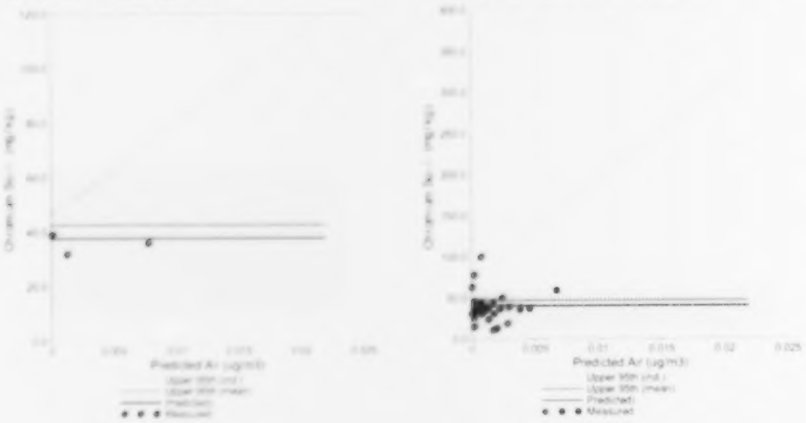


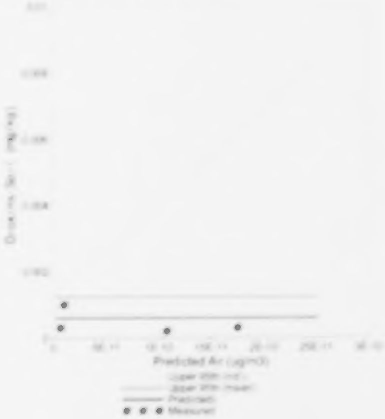
Figure A8 Chromium Relationships with Predicted Air Concentrations



a) Current with Noranda

b) Current with CCNB

Figure A9 Dioxins and Furans Relationships with Predicted Air Concentrations

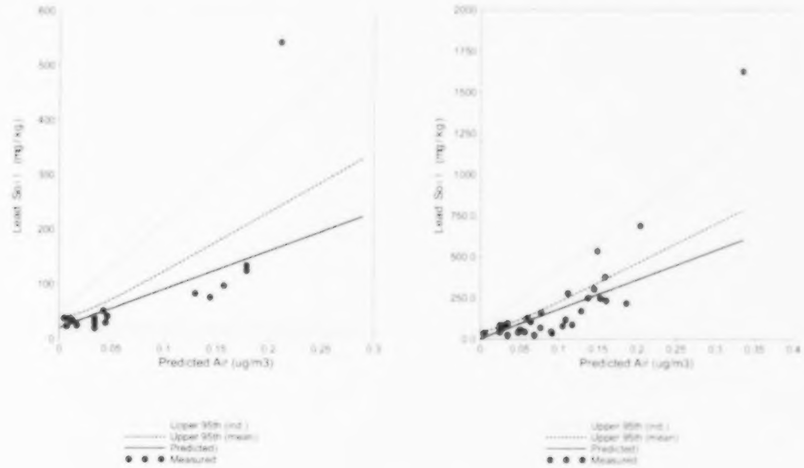


a) Current with Noranda

Figure A10 Lead Relationships with Predicted Air Concentration

a) Current with Noranda

b) Current with CCNB



c) 1985-1999 with Noranda

d) 1974-1984 with Noranda

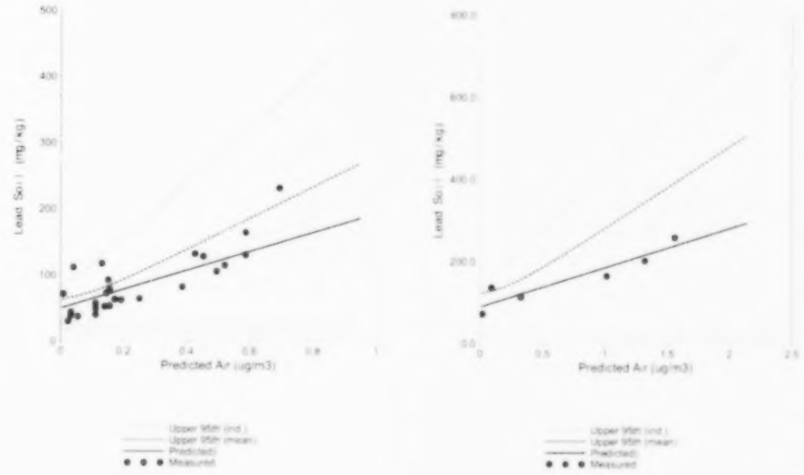
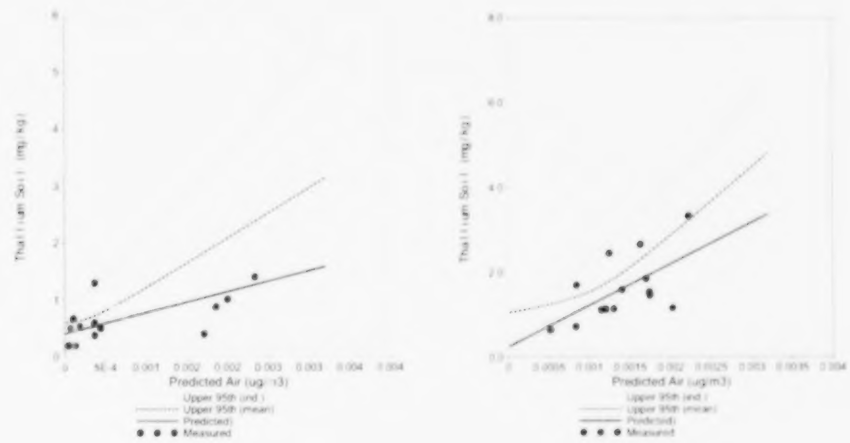
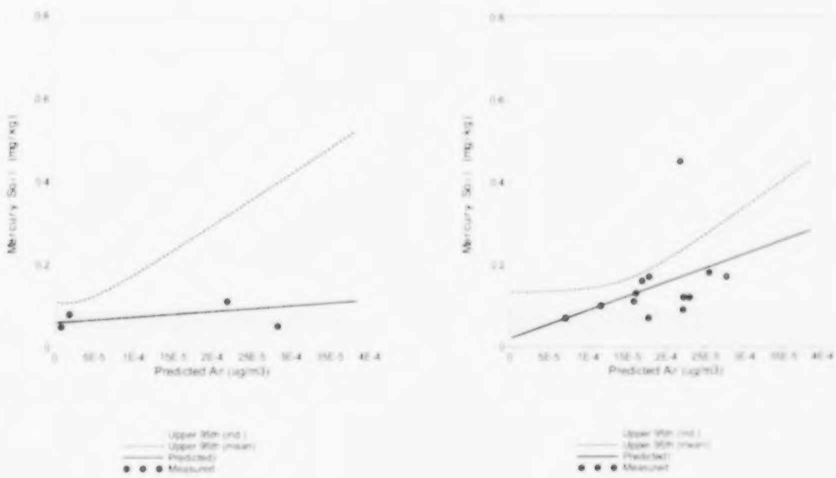


Figure A11 Thallium Relationships with Predicted Air Concentrations


a) Current with Noranda

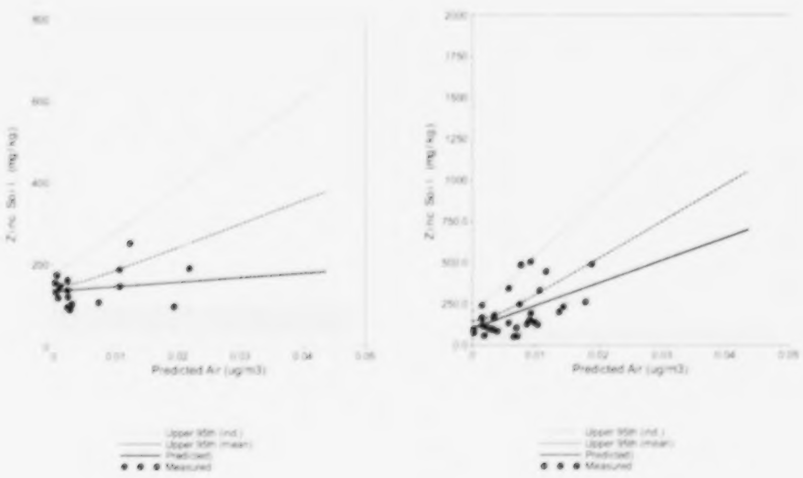
b) Current with CCNB

Figure A12Mercury Relationships with Predicted Air Concentrations


a) Current with Noranda

b) Current with CCNB

Figure A13Zinc Relationships with Predicted Air Concentrations



a) Current with Noranda b) Current with CCNB

Table A2.5 summarizes the relationships between measured soil concentrations and predicted air concentrations. Spearman correlation coefficients are provided along with the number of observations used to develop the relationship. Correlation coefficients range between -1 and 1 with a correlation coefficient of 0 indicating no correlation and a value of +1 indicating perfect positive correlation; that is, the value of soil concentration increases as air concentration increases. Most of the correlation coefficients are positive indicating that higher soil concentrations are statistically correlated with increasing predicted air concentrations. Exceptions are chromium and dioxins and furans which have negative correlation coefficients, which suggest that the dispersion of air emissions from the industrial area are not statistical related to soil concentrations.

P-values from an F-test of variation explained by the model are provided. Smaller p-values indicate decreasing probability that the observed relationship occurred by chance alone. With the exception of chromium and dioxins and furans, most of the p-values are 0.10 or lower indicating that the empirical relationships for most COPCs are unlikely to have arisen by chance alone. Estimates for the intercept and slope terms are provided in the tables.

Table A2.5 Empirical Relationships between Air and Soil Concentrations

Data	Time Period	Spearman Correlation	Number of Data Points	p-value	Intercept (mg/kg)	Slope (mg/kg per $\mu g/m^3$)
Arsenic						
EMP	Current	0.72	19	0.0068	10.92	1897
EMP	1985-1999	0.80	28	<.0001	15.42	1294
EMP	1975-1984	0.85	7	0.0652	18.1	463
CCNB	Current	0.52	32	0.0311	17.61	2299
Cadmium						
EMP	Current	0.90	19	<.0001	0.236	627
EMP	1985-1999	0.82	28	0.0002	0.487	94
EMP	1975-1984	0.97	7	0.0010	1.923	91
CCNB	Current	0.78	32	<.0001	0.032	1380
Chromium						
EMP	Current	-0.74	4	none	37.73	0
CCNB	Current	-0.05	32	none	40.47	0
Dioxins and Furans						
EMP	Current	-0.32	4	none	6E-4	0
Lead						
EMP	Current	0.86	19	0.0015	20.36	706
EMP	1985-1999	0.79	28	0.0049	50.02	143
EMP	1975-1984	0.96	7	0.0672	89.7	96
CCNB	Current	0.80	32	<.0001	3.784	1784
Mercury						
EMP	Current	0.11	4	0.6653	0.06	130
CCNB	Current	0.56	14	0.0557	0.022	677
Thallium						
EMP	Current	0.62	14	0.1478	0.411	367
CCNB	Current	0.58	14	0.0079	0.247	977
Zinc						
EMP	Current	0.20	19	0.6360	135.7	1072
CCNB	Current	0.54	32	0.0034	102.7	13662

A2.3 Calculation of EPC for Soil Concentrations

The empirical relationships between measured soil concentration and predicted air concentrations were used to predict soil concentrations from the estimated air concentrations at grid points within the study area. The best estimate of EPC for the study area was the mean of predicted soil concentrations at these grid points.

The upper 95th confidence interval on the predicted mean concentration at each grid point was estimated during the regression fitting. This number provides an upper bound on the soil concentration at each grid point; that is, it would be unlikely for the soil concentration at the grid point to exceed this value. These upper bound estimates were summarized for each study area to estimate the upper bound EPC. For Townsite #2 and Lower Belledune, the upper bound EPC is the highest UCLM estimated in the study area. This provides a conservative, or over-estimate, of the exposure concentration at the location with the highest soil concentration within the study area. For Belledune, Pointe-Verte and Petit-Rocher, the UCLMs were averaged. This provides an estimate of the upper bound for average concentrations over these study areas.

Table A2.6 shows an example for arsenic in soil EPCs for Belledune and Lower Belledune during the current period. The best estimate of the EPC for Belledune is 22.3 mg/kg with an upper bound EPC of 27.8 mg/kg. The average EPC for the Belledune study area is 22.3 mg/kg and unlikely to be higher than 27.8 mg/kg based on CCNB data. For the Lower Belledune study area, the best estimate of average EPC for the study area is 32.3 mg/kg and the EPC for the maximum exposure is unlikely to exceed 73.6 mg/kg compared to the best estimate of 49.0 mg/kg for the maximum exposure.

Table A2.6 Examples of Predicted Air (µg/m³) and Soil Concentrations (mg/kg) for Arsenic and the CCNB Relationship

	Predicted Air (µg/m³)	Predicted Soil (mg/kg)	UCL95M (mg/kg)
Arsenic Belledune Current	0.0013	20.6	25.2
	0.0014	20.9	25.4
	0.0013	20.5	25.1
	0.0015	21.2	25.6
	0.0018	21.8	26.2
	0.003	24.5	29.3
	0.0063	32	41.7
	0.0066	32.8	43.2
	0.0011	20.2	24.9
	0.001	19.9	24.7
	0.0008	19.4	24.4
	0.0009	19.8	24.7
	0.0009	19.7	24.6
	0.0006	19	24.3
	Mean	22.3 *	27.8 **
Arsenic Lower Belledune Current	0.003	24.4	29.1
	0.0036	25.8	31.1
	0.0033	25.2	30.3
	0.0038	26.2	31.8
	0.0044	27.6	34.1
	0.0044	27.8	34.4
	0.0041	27.1	33.1
	0.0052	29.7	37.6
	0.0048	28.6	35.8
	0.0052	29.6	37.4
	0.0059	31.2	40.3
	0.0063	32	41.7
	0.0064	32.4	42.4
	0.0058	30.9	39.7
	0.0062	31.8	41.4
	0.0071	33.9	45.2
	0.0071	34	45.5
	0.008	36.1	49.3
	0.009	38.3	53.3
	0.0078	35.5	48.1
	0.0101	40.7	57.9
	0.0119	45	65.8
	0.0137	49.1	73.6
	Mean	32.3*	42.6
	Maximum	49.0	73.6 **

Notes:

best estimate EPC for the study area
** upper bound EPC for study area

A2.4 Uncertainties

Sources of uncertainties include the fact that there are fewer soil measurements for historical time periods than there are for the current time period. For example, no soil data are available for the 1967 to 1974 period. In addition, not all COPC have been measured extensively in soil. In addition, not all geographical coordinates have been provided. Some uncertainty is also introduced by differences in sample collection and analytical methodologies between data sets, this was resolved by treating the two largest data sets (Noranda and CCNB) separately. While there is uncertainty in applying the relationship between air and soil, these uncertainties have been explicitly quantified by the UCL of the predicted values. The UCL provides a statistical and scientific numeric value of the concentration which is unlikely to be exceeded.

A3.0 Garden Produce

The maps show in the figures below present means of measurements at different locations (since 2003) averaged over all produce types in mg/kg wet weight. The maps do not show forage results.

Figure A14 Map Showing Arsenic Concentrations in Garden Produce (mg/kg wet weight)

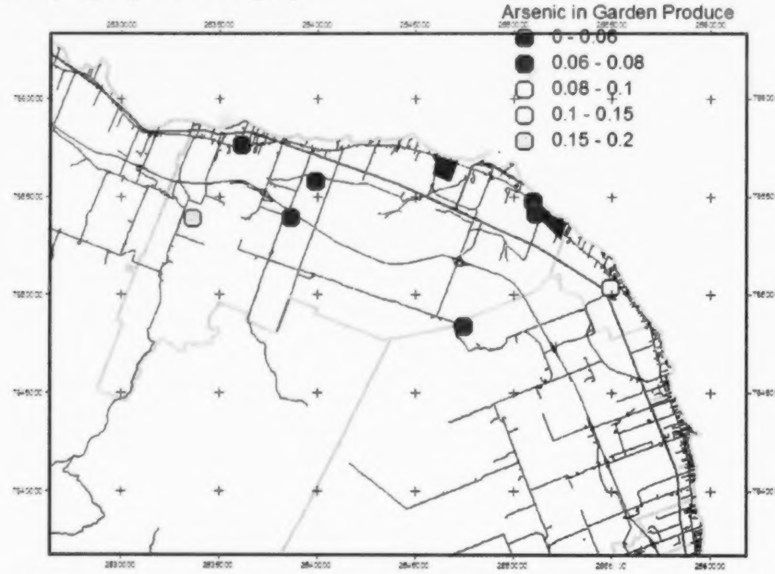


Figure A15 Map Showing Cadmium Concentrations in Garden Produce (mg/kg wet weight)

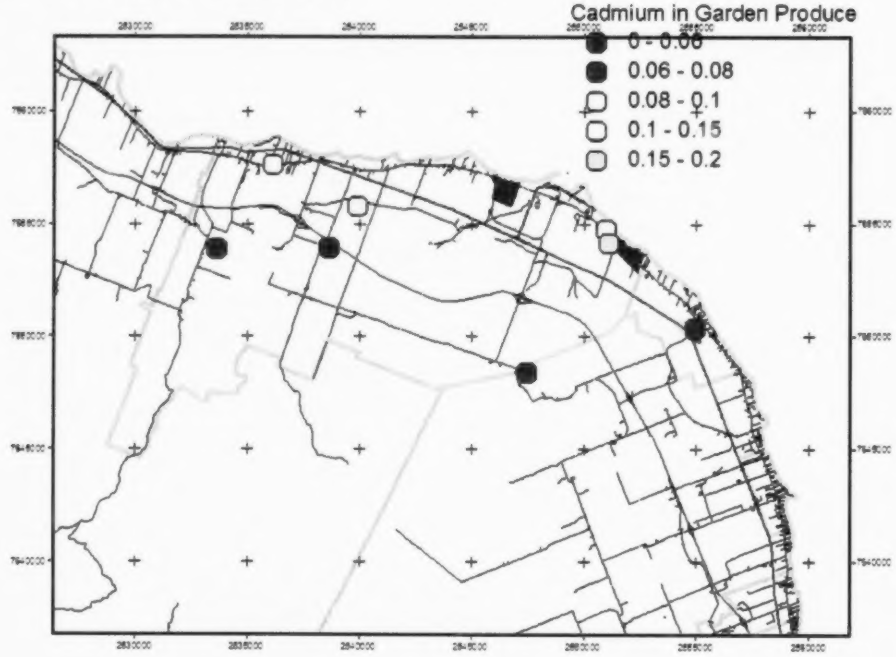


Figure A16 Map Showing Lead Concentrations in Garden Produce (mg/kg wet weight)

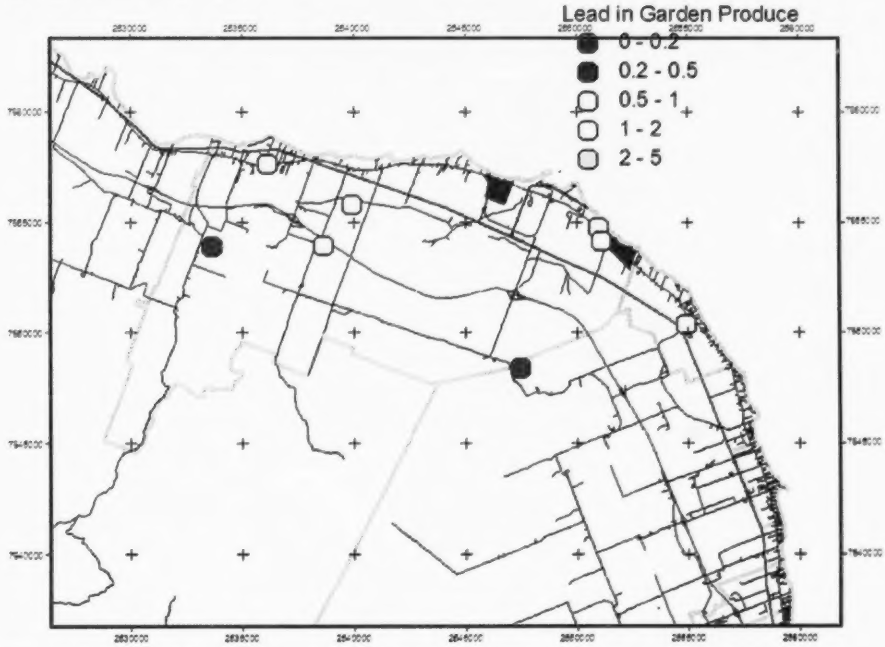
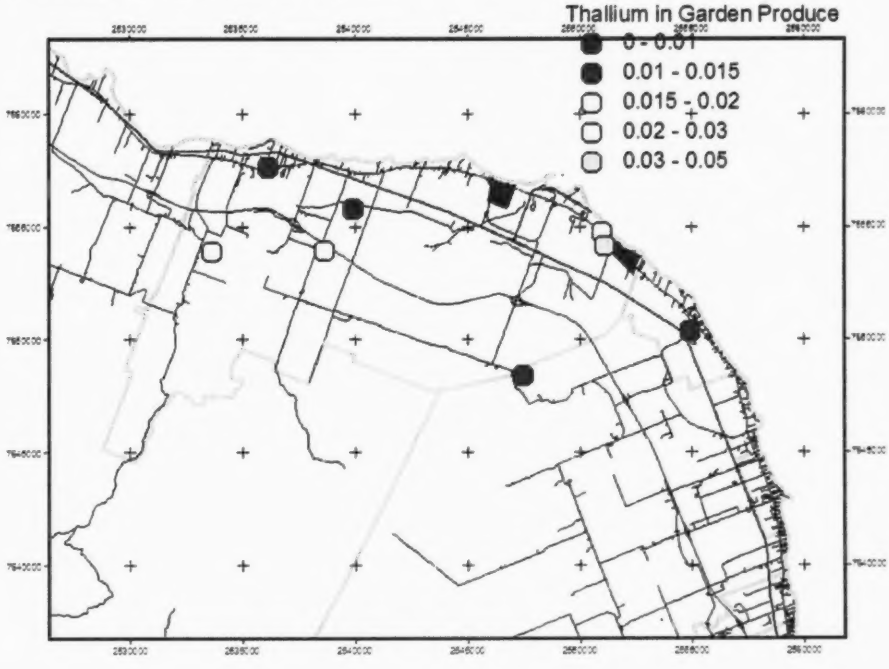


Figure A17 Map Showing Arsenic Concentrations in Garden Produce (mg/kg wet weight)



The following table (Table A3.1) shows measurement data since 2000 from the Noranda EMP for garden produce in mg/kg wet weight (Brunswick Mining and Smelting Corporation, 2004d).

Table A3.1 Garden Measurement Data (mg/kg (wet)) Collected Since 2000

Location	SubMedia	Year	Arsenic	Cadmium	Lead	Thallium
Garden:						
Garden J	Beans	2000	0.060	0.010	0.27	<0.010
Garden J	Beans	2001	0.040	0.020	0.40	<0.010
Garden J	Beans	2002	0.050	0.010	0.26	<0.010
Garden J	Carrots	2001	0.080	0.060	0.60	<0.010
Garden J	Carrots	2002	0.070	0.030	0.26	0.020
Garden J	Lettuce	2000	0.070	0.10	0.83	<0.010
Garden J	Lettuce	2002	0.080	0.090	0.50	0.010
Garden EE1	Raspberries	2000	0.18		0.17	<0.020
Garden DD	Strawberries	2000	0.13	0.020	0.30	<0.020
Garden DD	Strawberries	2001	0.12		0.50	0.020
Garden DD	Strawberries	2002	0.19	0.010	0.73	0.050
Garden EE1	Strawberries	2000	0.13	0.020	0.13	<0.020
Garden EE1	Strawberries	2001	0.12		0.20	0.030
Garden EE1	Strawberries	2002	0.18	0.010	0.50	0.060
Garden MM	Strawberries	2000	0.13	0.010	0.10	<0.020
Garden MM	Strawberries	2001	0.16		0.20	0.010
Garden MM	Strawberries	2002	0.13	0.010	0.50	0.030
Belledune: Garden						
Garden D	Beans	2000	0.060	0.010	0.40	
Garden D	Beans	2001	0.060	0.010	0.70	
Garden D	Beans	2002	0.080	0.010	0.40	0.020
Garden I	Beans	2000	0.090	0.020	0.53	<0.010
Garden I	Beans	2001	0.040	0.010	0.40	0.010
Garden I	Beans	2002	0.080	0.020	0.83	0.010
Garden P	Beans	2002	0.050	0.030	0.30	0.010
Garden W	Beans	2000	0.060		0.40	<0.010
Garden W	Beans	2001	0.090	0.010	2.8	<0.010
Garden W	Beans	2002	0.060	0.010	0.40	0.050
Garden D	Carrots	2000	0.080	0.83	0.30	0.010
Garden D	Carrots	2001	0.040	0.080	0.20	
Garden D	Carrots	2002	0.080	0.080	0.50	0.030
Garden I	Carrots	2000	0.090	0.040	0.23	<0.010
Garden I	Carrots	2001	0.070	0.21	0.20	0.010
Garden I	Carrots	2002	0.060	0.32	0.93	0.020
Garden P	Carrots	2000		0.10	0.40	<0.010
Garden P	Carrots	2001	0.040	0.12	0.30	0.010
Garden P	Carrots	2002	0.070	0.10	0.20	0.010
Garden W	Carrots	2000	0.090	0.10	0.10	<0.010
Garden W	Carrots	2001	0.030	0.10	0.20	
Garden W	Carrots	2002	0.060	0.060	0.40	0.020
Garden D	Lettuce	2001	0.070	0.17	2.2	
Garden D	Lettuce	2002	0.12	0.34	6.3	0.070
Garden I	Lettuce	2000	0.090	0.090		<0.010
Garden I	Lettuce	2002	0.12	0.25	0.86	0.020
Garden P	Lettuce	2001	0.050	0.14	0.40	
Garden P	Lettuce	2002	0.080	0.090	1.5	0.020
Garden W	Lettuce	2000	0.13	0.10	1.0	<0.010
Garden W	Lettuce	2001	0.090	0.14	0.83	0.010
Garden W	Lettuce	2002	0.090	0.070	1.4	0.020
Garden GG1	Raspberries	2000	0.13	0.030		<0.020
Garden GG1	Raspberries	2001	0.23	0.060	0.30	0.020
Garden GG1	Raspberries	2002	0.16	0.020	0.40	0.020

Table A3.1 Garden Measurement Data (mg/kg (wet)) Collected Since 2000 (Cont'd)

Location	SubMedia	Year	Arsenic	Cadmium	Lead	Thallium
Lower Belledune: Garden						
Garden C	Beans	2000	0.060	0.010	0.30	<0.010
Garden C	Beans	2001		0.030	0.60	0.020
Garden C	Beans	2002		0.040	0.90	0.020
Garden C	Carrots	2000	0.060	0.18	0.37	<0.010
Garden C	Carrots	2001		0.16	0.40	0.020
Garden C	Carrots	2002		0.17	0.50	0.040
Pointe-Verte: Garden						
Garden KK	Beans	2000	0.10			
Garden KK	Beans	2001		0.010	0.30	<0.010
Garden KK	Beans	2002	0.060	0.020	1.3	0.010
Garden KK	Carrots	2000		0.070	0.47	0.010
Garden KK	Carrots	2001		0.080	0.20	0.010
Garden KK	Carrots	2002	0.080	0.070	0.40	<0.010
Garden KK	Lettuce	2002	0.12	0.12	2.6	0.030

A.3.1 Noranda EMP

Concentrations in vegetables have been measured by the Noranda EMP over an extended period of time (Brunswick Mining and Smelting Corporation, 2004d). Most of the monitoring locations have been in Belledune with fewer garden locations in Pointe-Verte, Petit-Rocher and surrounding areas.

Table 3.2 shows the garden locations reported along with geographic coordinates, if available. The direction and distance (km) from the Noranda smelter are provided as well as designation of the study area.

Table A3.2 Summary of Noranda EMP Garden Locations

Location	Core Community	Subarea
Garden A	Belledune	Industrial Area
Garden B	Belledune	Lower Belledune
Garden C	Belledune	Lower Belledune
Garden C-3	Outside GBA	
Garden C-5	Outside GBA	
Garden D	Belledune	Townsite
Garden E	Belledune	Townsite
Garden F	Belledune	Belledune
Garden G	Pointe-Verte	
Garden H	Belledune	Belledune
Garden HH	Belledune	Belledune
Garden I	Belledune	Belledune
Garden II	Belledune	Belledune
Garden J	Belledune	Belledune
Garden K	Outside GBA	
Garden KK	Pointe-Verte	
Garden L	Outside GBA	
Garden M	Outside GBA	
Garden N	Petit-Rocher	

Table A3.2 Summary of Noranda EMP Garden Locations (Cont'd)

Location	Core Community	Subarea
Garden O	Beledune	Belledune
Garden P	Belledune	Belledune
Garden PP	Belledune	Belledune
Garden Q	Belledune	Belledune
Garden R	Belledune	Belledune
Garden S	Belledune	Belledune
Garden T	Belledune	Belledune
Garden TT	Belledune	Belledune
Garden U	Pointe-Verte	
Garden V	Belledune	Lower Belledune
Garden W	Belledune	Belledune
Garden X	Pointe-Verte	
Garden Y	Belledune	Belledune
Garden Z	Belledune	Industrial Area

Many vegetables or specific parts of vegetables were measured (e.g., carrot tops, carrots, peas). For the HHRA, the vegetables were classified into categories of root and other vegetables. Table A3.3 shows the vegetables assigned to the two categories.

Table A3.3 Categorization of Garden Vegetables with Measured Concentrations

Root Vegetables	Other Vegetables
Beets	Asparagus
Carrots	Beans
Onions	Beet Stems
Potatoes	Beet Tops
Radish	Broccoli
Turnips	Cabbage
	Carrot Tops
	Corn
	Cucumbers
	Green Beans
	Lettuce
	Peas
	Purple Beans
	Radish Tops
	Rhubarb
	Rhubarb Tops
	Spinach
	Swiss Chard
	Tomatoes

Table A3.4 summarizes the EMP measurements by vegetable type, time period, COPC and monitoring location. The table shows the mean measured concentration, the maximum measured concentration and the number of measurements. Generally there are more measurements during the 1975-1984 and 1985-1999 time periods and in the 1967-1974 and current time period. Concentrations if lead, cadmium and zinc were measured in vegetables since the 1967-1974 time period. Arsenic was not measured until the 1975-1984 time period and thallium measurements began in the 1984-1999 time period. Concentrations of dioxins and furans, chromium and mercury were not measured as a regular part of the Noranda EMP program.

Table A3.4 Summary of Garden Vegetable Concentrations (mg/kg(wet))

Location	**1967-1974**	**1975-1984**	**1985-1999**	**Current**
Arsenic in OTHER Vegetables				
Garden A		0.28 (max: 0.98 obs:18)	0.32 (max: 1.1 obs:6)	
Garden B		0.464 (max: 3.27 obs:18)		
Garden C		0.191 (max: 1.11 obs:17)	0.131 (max: 0.63 obs:15)	0.055 (max: 0.06 obs:4)
Garden C-3		0.453 (max: 2.72 obs:7)		
Garden C-5		0.06 (max: 0.09 obs:3)		
Garden D			0.04 (max: 0.04 obs:1)	0.077 (max: 0.12 obs:7)
Garden Dorig		0.294 (max: 1.67 obs:17)	0.138 (max: 0.5 obs:5)	
Garden E		0.142 (max: 0.61 obs:15)	0.078 (max: 0.27 obs:22)	
Garden F		0.213 (max: 0.8 obs:15)	0.034 (max: 0.17 obs:7)	
Garden G		0.232 (max: 0.78 obs:16)	1.597 (max: 21.8 obs:14)	
Garden H		0.134 (max: 0.7 obs:9)	0.063 (max: 0.14 obs:4)	
Garden HH			0.04 (max: 0.05 obs:2)	
Garden I		0.191 (max: 0.57 obs:14)	0.062 (max: 0.16 obs:21)	0.082 (max: 0.12 obs:6)
Garden J		0.086 (max: 0.18 obs:5)	0.045 (max: 0.15 obs:19)	0.06 (max: 0.08 obs:7)
Garden K		0.04 (max: 0.09 obs:3)		
Garden KK			0.102 (max: 0.21 obs:6)	0.078 (max: 0.12 obs:4)
Garden L		0.053 (max: 0.07 obs:4)		
Garden M		0.07 (max: 0.14 obs:3)		
Garden N		0.199 (max: 0.43 obs:8)		
Garden O		0.18 (max: 0.34 obs:4)	0.164 (max: 1.31 obs:16)	
Garden P		0.27 (max: 0.53 obs:4)	0.056 (max: 0.16 obs:23)	0.058 (max: 0.08 obs:5)
Garden PP			0.12 (max: 0.12 obs:1)	0.09 (max: 0.09 obs:1)
Garden Q		0.085 (max: 0.12 obs:4)	0.025 (max: 0.03 obs:2)	
Garden R		0.14 (max: 0.36 obs:7)		
Garden S		0.135 (max: 0.15 obs:2)		

Table A3.4 Summary of Garden Vegetable Concentrations (mg/kg(wet)) (Cont'd)

Location	1967-1974	1975-1984	1985-1999	Current
Garden T			0.061 (max: 0.13 obs:21)	0.115 (max: 0.15 obs:2)
Garden TT			0.02 (max: 0.02 obs:1)	
Garden U			0.018 (max: 0.02 obs:2)	
Garden Y			0.067 (max: 0.4 obs:13)	
Garden Z			0.02 (max: 0.03 obs:2)	
Cadmium in OTHER Vegetables				
Garden A	0.082 (max: 0.3 obs:10)	0.689 (max: 4.02 obs:21)	0.443 (max: 1.08 obs:8)	
Garden B	0.058 (max: 0.2 obs:8)	1.119 (max: 4.44 obs:19)		
Garden C	0.041 (max: 0.17 obs:7)	0.453 (max: 3.14 obs:18)	0.318 (max: 1.5 obs:16)	0.023 (max: 0.04 obs:4)
Garden C-3	0.022 (max: 0.07 obs:5)	0.101 (max: 0.17 obs:7)		
Garden C-5	0.016 (max: 0.04 obs:5)	0.042 (max: 0.08 obs:5)		
Garden D			0.01 (max: 0.01 obs:1)	0.091 (max: 0.34 obs:7)
Garden Dorig	0.04 (max: 0.08 obs:3)	0.259 (max: 1.54 obs:20)	0.108 (max: 0.25 obs:5)	
Garden E	0.107 (max: 0.53 obs:7)	0.211 (max: 0.85 obs:20)	0.136 (max: 0.7 obs:24)	
Garden F	0.17 (max: 0.56 obs:4)	0.252 (max: 1.17 obs:19)	0.319 (max: 1.63 obs:10)	
Garden G	0.04 (max: 0.06 obs:2)	0.262 (max: 1.72 obs:21)	0.086 (max: 0.3 obs:16)	
Garden H		0.117 (max: 0.39 obs:11)	0.221 (max: 0.81 obs:4)	
Garden HH			0.03 (max: 0.03 obs:2)	
Garden I	0.01 (max: 0.01 obs:2)	0.258 (max: 1.17 obs:18)	0.072 (max: 0.45 obs:25)	0.066 (max: 0.25 obs:6)
Garden J		0.152 (max: 0.24 obs:5)	0.092 (max: 0.24 obs:18)	0.047 (max: 0.1 obs:7)
Garden K		0.137 (max: 0.2 obs:3)		
Garden KK			0.041 (max: 0.12 obs:6)	0.04 (max: 0.12 obs:4)
Garden L		0.108 (max: 0.32 obs:4)		
Garden M		0.2 (max: 0.52 obs:3)		
Garden N		0.124 (max: 0.25 obs:10)		
Garden O		0.213 (max: 0.52 obs:6)	0.162 (max: 0.63 obs:18)	
Garden P		0.402 (max: 1.55 obs:6)	0.107 (max: 0.31 obs:27)	0.076 (max: 0.14 obs:5)
Garden PP			0.008 (max: 0.01 obs:1)	0.02 (max: 0.02 obs:1)
Garden Q		0.068 (max: 0.15 obs:4)	0.036 (max: 0.06 obs:2)	
Garden R		0.124 (max: 0.32 obs:7)		
Garden S		0.055 (max: 0.07 obs:2)		

Table A3.4 Summary of Garden Vegetable Concentrations (mg/kg(wet)) (Cont'd)

Location	1967-1974	1975-1984	1985-1999	Current
Garden T			0.103 (max: 0.38 obs:21)	0.01 (max: 0.01 obs:1)
Garden TT			0.01 (max: 0.01 obs:1)	
Garden U			0.016 (max: 0.02 obs:2)	
Garden W			0.061 (max: 0.16 obs:25)	0.049 (max: 0.14 obs:8)
Garden X			0.162 (max: 0.37 obs:10)	
Garden Y			0.188 (max: 0.96 obs:13)	
Garden Z			1.76 (max: 3.43 obs:2)	
Lead in OTHER Vegetables				
Garden A	4.196 (max: 10.5 obs:5)	4.628 (max: 30.2 obs:20)	4.124 (max: 15.6 obs:8)	
Garden B	0.71 (max: 2.36 obs:5)	7.022 (max: 45.6 obs:19)		
Garden C	0.206 (max: 0.36 obs:5)	2.934 (max: 12 obs:17)	1.348 (max: 9.96 obs:17)	0.535 (max: 0.9 obs:4)
Garden D			0.46 (max: 0.46 obs:1)	1.651 (max: 6.3 obs:7)
Garden Dorig	1.475 (max: 2.49 obs:2)	3.419 (max: 12.5 obs:19)	1.594 (max: 4.14 obs:5)	
Garden E	4.333 (max: 11.2 obs:4)	2.926 (max: 22.4 obs:20)	0.923 (max: 4.8 obs:24)	
Garden F	0.94 (max: 2.04 obs:4)	2.687 (max: 9.94 obs:19)	0.488 (max: 1.09 obs:9)	
Garden G	0.19 (max: 0.31 obs:2)	2.484 (max: 8.32 obs:21)	3.973 (max: 56.1 obs:16)	
Garden H		1.905 (max: 6.57 obs:10)	0.709 (max: 1.17 obs:4)	
Garden HH			0.35 (max: 0.4 obs:2)	
Garden I	0.135 (max: 0.26 obs:2)	3.227 (max: 16 obs:19)	0.556 (max: 1.35 obs:22)	0.644 (max: 0.86 obs:5)
Garden J		0.94 (max: 1.4 obs:5)	0.586 (max: 2.3 obs:18)	0.443 (max: 0.83 obs:7)
Garden K		0.3 (max: 0.4 obs:3)		
Garden KK			0.682 (max: 1.43 obs:6)	1.237 (max: 2.6 obs:4)
Garden L		1.975 (max: 6.3 obs:4)		
Garden M		0.933 (max: 2 obs:3)		
Garden N		2.39 (max: 8.87 obs:10)		
Garden O		1.283 (max: 4.2 obs:6)	0.415 (max: 1.96 obs:18)	
Garden P		2.58 (max: 6.67 obs:6)	0.578 (max: 1.7 obs:25)	0.612 (max: 1.5 obs:5)
Garden PP			0.12 (max: 0.12 obs:1)	0.23 (max: 0.23 obs:1)
Garden Q		0.675 (max: 1.5 obs:4)	0.655 (max: 1.03 obs:2)	
Garden R		2.986 (max: 7.2 obs:7)		
Garden S		0.725 (max: 1.05 obs:2)		

Table A3.4 Summary of Garden Vegetable Concentrations (mg/kg(wet)) (Cont'd)

Location	**1967-1974**	**1975-1984**	**1985-1999**	**Current**
Garden T			0.814 (max: 2.8 obs:21)	0.3 (max: 0.3 obs:1)
Garden TT			0.3 (max: 0.3 obs:1)	
Garden X			1.188 (max: 2.72 obs:10)	
Garden Y			0.807 (max: 3.13 obs:13)	
Garden Z			0.625 (max: 1.03 obs:2)	
Thallium in OTHER Vegetables				
Garden C			0.012 (max: 0.04 obs:9)	0.014 (max: 0.02 obs:4)
Garden D			0.01 (max: 0.01 obs:1)	0.026 (max: 0.07 obs:4)
Garden Dorig			0.005 (max: 0.01 obs:1)	
Garden E			0.023 (max: 0.07 obs:14)	
Garden F			0.018 (max: 0.03 obs:2)	
Garden G			0.013 (max: 0.02 obs:6)	
Garden H			0.005 (max: 0.01 obs:1)	
Garden HH			0.01 (max: 0.01 obs:1)	
Garden I			0.016 (max: 0.05 obs:13)	0.009 (max: 0.02 obs:6)
Garden J			0.012 (max: 0.03 obs:9)	0.006 (max: 0.01 obs:7)
Garden KK			0.01 (max: 0.02 obs:6)	0.013 (max: 0.03 obs:4)
Garden O			0.019 (max: 0.08 obs:8)	
Garden P			0.012 (max: 0.03 obs:16)	0.009 (max: 0.02 obs:5)
Garden PP			0.01 (max: 0.01 obs:1)	0.01 (max: 0.01 obs:1)
Garden T			0.014 (max: 0.03 obs:15)	0.015 (max: 0.03 obs:2)
Garden TT			0.005 (max: 0.01 obs:1)	
Garden U			0.002 (max: 0 obs:1)	
Garden W			0.011 (max: 0.03 obs:16)	0.009 (max: 0.02 obs:8)
Garden X			0.014 (max: 0.02 obs:5)	
Garden Y			0.023 (max: 0.08 obs:6)	
Zinc in OTHER Vegetables				
Location	1967-1974	1975-1984	1985-1999	Current

Table A3.4 Summary of Garden Vegetable Concentrations (mg/kg(wet)) (Cont'd)

Location	1967-1974	1975-1984	1985-1999	Current
Garden A	7.329 (max: 15 obs:10)	19.74 (max: 64.3 obs:21)	12.79 (max: 46.4 obs:8)	
Garden B	5.041 (max: 11.7 obs:8)	34.1 (max: 143 obs:19)		
Garden C	3.109 (max: 7.64 obs:7)	20 (max: 191 obs:18)	9.163 (max: 56.3 obs:17)	4.798 (max: 7.8 obs:4)
Garden C-3	2.364 (max: 3.6 obs:5)	8.531 (max: 17.3 obs:7)		
Garden C-5	2.228 (max: 5.22 obs:5)	2.846 (max: 4.57 obs:5)		
Garden D			5.6 (max: 5.6 obs:1)	5.72 (max: 15.8 obs:7)
Garden Dorig	2.87 (max: 3.08 obs:3)	11.87 (max: 67.6 obs:20)	7.034 (max: 14.6 obs:5)	
Garden E	6.54 (max: 11.1 obs:7)	5.259 (max: 17.6 obs:20)	3.627 (max: 16 obs:23)	
Garden F	3.24 (max: 3.7 obs:4)	7.542 (max: 25.8 obs:19)	11.02 (max: 37.5 obs:9)	
Garden G	3.205 (max: 3.67 obs:2)	16.71 (max: 114 obs:21)	4.58 (max: 18.7 obs:16)	
Garden H		5.013 (max: 11.3 obs:11)	2.95 (max: 3 obs:2)	
Garden HH			5.5 (max: 7 obs:2)	
Garden I	2.16 (max: 3.36 obs:2)	31.78 (max: 188 obs:18)	4.189 (max: 14.8 obs:23)	6.49 (max: 9.2 obs:6)
Garden J		5.996 (max: 13.3 obs:5)	2.932 (max: 8.14 obs:19)	3.941 (max: 5.66 obs:7)
Garden K		2.607 (max: 3.62 obs:3)		
Garden KK			2.882 (max: 3.5 obs:6)	4.995 (max: 6.4 obs:4)
Garden L		3.615 (max: 6.81 obs:4)		
Garden M		17.4 (max: 37.9 obs:3)		
Garden N		7.931 (max: 20.8 obs:10)		
Garden O		5.922 (max: 13.8 obs:6)	4.259 (max: 14.6 obs:18)	
Garden P		43.98 (max: 202 obs:6)	5.464 (max: 30.8 obs:24)	6.53 (max: 17.4 obs:5)
Garden PP			4.3 (max: 4.3 obs:1)	6.23 (max: 6.23 obs:1)
Garden Q		2.783 (max: 4.62 obs:4)	4.235 (max: 6.06 obs:2)	
Garden R		24.29 (max: 62.9 obs:7)		
Garden S		4.1 (max: 4.89 obs:2)		
Garden T			3.348 (max: 6.03 obs:18)	3.73 (max: 3.73 obs:1)
Garden TT			3.9 (max: 3.9 obs:1)	
Garden U			4.695 (max: 5.29 obs:2)	
Garden W			2.777 (max: 4.73 obs:24)	9.893 (max: 33.9 obs:8)
Garden X			3.859 (max: 6.6 obs:10)	
Garden Y			7.81 (max: 28.2 obs:13)	
Garden Z			19.41 (max: 34 obs:2)	

Table A3.4 Summary of Garden Vegetable Concentrations (mg/kg(wet)) (Cont'd)

Location	1967-1974	1975-1984	1985-1999	Current
Arsenic in ROOT Vegetables				
Garden A		0.269 (max: 1.05 obs:8)	0.058 (max: 0.12 obs:4)	
Garden B		0.091 (max: 0.23 obs:9)		
Garden C		0.193 (max: 1.15 obs:10)	0.045 (max: 0.11 obs:12)	0.077 (max: 0.11 obs:3)
Garden C-3		0.095 (max: 0.22 obs:4)		
Garden C-5		0.055 (max: 0.08 obs:2)		
Garden D			0.07 (max: 0.1 obs:2)	0.058 (max: 0.08 obs:4)
Garden Dorig		0.085 (max: 0.2 obs:10)	0.037 (max: 0.06 obs:3)	
Garden E		0.118 (max: 0.44 obs:11)	0.054 (max: 0.15 obs:11)	
Garden F		0.1 (max: 0.27 obs:10)	0.02 (max: 0.04 obs:4)	
Garden G		0.124 (max: 0.27 obs:7)	0.113 (max: 0.35 obs:7)	
Garden H		0.117 (max: 0.25 obs:6)	0.03 (max: 0.08 obs:8)	
Garden HH			0.035 (max: 0.06 obs:4)	
Garden I		0.058 (max: 0.13 obs:9)	0.043 (max: 0.11 obs:11)	0.063 (max: 0.09 obs:4)
Garden II			0.04 (max: 0.08 obs:2)	
Garden J		0.063 (max: 0.1 obs:4)	0.025 (max: 0.08 obs:10)	0.063 (max: 0.08 obs:3)
Garden K		0.047 (max: 0.08 obs:3)		
Garden KK			0.122 (max: 0.14 obs:2)	0.07 (max: 0.09 obs:4)
Garden L		0.033 (max: 0.06 obs:3)		
Garden M		0.035 (max: 0.06 obs:2)		
Garden N		0.044 (max: 0.08 obs:5)		
Garden O			0.028 (max: 0.16 obs:10)	0.1 (max: 0.1 obs:1)
Garden P		0.145 (max: 0.23 obs:2)	0.053 (max: 0.11 obs:20)	0.047 (max: 0.07 obs:3)
Garden PP			0.09 (max: 0.14 obs:3)	0.11 (max: 0.11 obs:1)
Garden Q		0.063 (max: 0.12 obs:3)	0.03 (max: 0.03 obs:1)	
Garden R		0.097 (max: 0.14 obs:3)		
Garden S		0.1 (max: 0.1 obs:1)		
Garden T			0.034 (max: 0.1 obs:9)	0.06 (max: 0.06 obs:1)
Garden TT			0.06 (max: 0.12 obs:4)	0.13 (max: 0.13 obs:1)
Garden U			0.01 (max: 0.01 obs:1)	
Garden V			0.02 (max: 0.02 obs:1)	
Garden W			0.044 (max: 0.1 obs:12)	0.046 (max: 0.09 obs:4)

Table A3.4 Summary of Garden Vegetable Concentrations (mg/kg(wet)) (Cont'd)

Location	1967-1974	1975-1984	1985-1999	Current
Garden X			0.077 (max: 0.5 obs:8)	
Garden Y			0.02 (max: 0.06 obs:7)	
Garden Z			0.01 (max: 0.01 obs:1)	
Cadmium in ROOT Vegetables				
Garden A	0.088 (max: 0.1 obs:4)	0.382 (max: 1.03 obs:10)	0.207 (max: 0.25 obs:5)	
Garden B	0.053 (max: 0.12 obs:3)	0.119 (max: 0.38 obs:9)		
Garden C	0.043 (max: 0.06 obs:4)	0.087 (max: 0.25 obs:10)	0.225 (max: 0.49 obs:13)	0.17 (max: 0.18 obs:3)
Garden C-3	0.01 (max: 0.01 obs:1)	0.098 (max: 0.24 obs:4)		
Garden C-5	0.04 (max: 0.06 obs:2)	0.04 (max: 0.07 obs:2)		
Garden D			0.141 (max: 0.15 obs:2)	0.078 (max: 0.08 obs:4)
Garden Dorig	0.06 (max: 0.09 obs:2)	0.121 (max: 0.4 obs:10)	0.186 (max: 0.25 obs:3)	
Garden E	0.29 (max: 0.47 obs:6)	0.122 (max: 0.34 obs:12)	0.117 (max: 0.17 obs:11)	
Garden F	0.04 (max: 0.07 obs:2)	0.121 (max: 0.43 obs:10)	0.357 (max: 0.46 obs:5)	
Garden G	0.05 (max: 0.05 obs:1)	0.077 (max: 0.24 obs:9)	0.111 (max: 0.14 obs:8)	
Garden H		0.06 (max: 0.14 obs:6)	0.158 (max: 0.49 obs:9)	
Garden HH			0.305 (max: 0.48 obs:4)	
Garden I	0.01 (max: 0.01 obs:1)	0.166 (max: 0.92 obs:9)	0.072 (max: 0.15 obs:12)	0.166 (max: 0.33 obs:4)
Garden II			0.103 (max: 0.12 obs:3)	
Garden J		0.076 (max: 0.17 obs:5)	0.067 (max: 0.12 obs:10)	0.043 (max: 0.06 obs:3)
Garden K		0.143 (max: 0.21 obs:3)		
Garden KK			0.106 (max: 0.13 obs:2)	0.068 (max: 0.08 obs:4)
Garden L		0.043 (max: 0.05 obs:3)		
Garden M		0.035 (max: 0.04 obs:2)		
Garden N		0.057 (max: 0.12 obs:6)		
Garden O		0.26 (max: 0.36 obs:2)	0.173 (max: 0.34 obs:11)	0.12 (max: 0.12 obs:1)
Garden P		0.173 (max: 0.25 obs:4)	0.205 (max: 0.41 obs:13)	0.12 (max: 0.14 obs:4)
Garden PP			0.056 (max: 0.14 obs:4)	0.02 (max: 0.02 obs:1)
Garden Q		0.05 (max: 0.06 obs:3)	0.023 (max: 0.02 obs:1)	
Garden R		0.097 (max: 0.14 obs:3)		
Garden S		0.09 (max: 0.09 obs:1)		
Garden T			0.122 (max: 0.28 obs:9)	0.14 (max: 0.14 obs:1)

Table A3.4 Summary of Garden Vegetable Concentrations (mg/kg(wet)) (Cont'd)

Location	1967-1974	1975-1984	1985-1999	Current
Garden TT			0.104 (max: 0.18 obs:5)	0.05 (max: 0.05 obs:1)
Garden U			0.07 (max: 0.07 obs:1)	
Garden V			0.2 (max: 0.2 obs:1)	
Garden W			0.072 (max: 0.2 obs:10)	0.068 (max: 0.1 obs:4)
Garden X			0.174 (max: 0.34 obs:8)	
Garden Y			0.313 (max: 0.52 obs:7)	
Garden Z			0.66 (max: 0.66 obs:1)	
Lead in ROOT Vegetables				
Garden A	0.82 (max: 0.82 obs:1)	4.331 (max: 10.5 obs:7)	0.798 (max: 1.5 obs:5)	
Garden B	0.265 (max: 0.37 obs:2)	2.486 (max: 14.8 obs:9)		
Garden C	0.31 (max: 0.33 obs:2)	0.779 (max: 2.24 obs:11)	0.427 (max: 1.36 obs:13)	0.423 (max: 0.5 obs:3)
Garden D			0.265 (max: 0.27 obs:2)	0.35 (max: 0.5 obs:4)
Garden Dorig	0.29 (max: 0.29 obs:1)	1.471 (max: 4.19 obs:10)	0.41 (max: 0.53 obs:3)	
Garden E	0.38 (max: 0.53 obs:2)	1.142 (max: 3.56 obs:11)	0.292 (max: 0.7 obs:12)	
Garden F	0.33 (max: 0.38 obs:2)	1.778 (max: 8.74 obs:10)	0.278 (max: 0.59 obs:5)	
Garden G	0.17 (max: 0.17 obs:1)	0.731 (max: 1.68 obs:9)	0.388 (max: 1.19 obs:8)	
Garden H		1.495 (max: 5.32 obs:6)	0.141 (max: 0.33 obs:9)	
Garden HH			0.175 (max: 0.3 obs:4)	
Garden I	0.22 (max: 0.22 obs:1)	0.734 (max: 1.62 obs:9)	0.227 (max: 0.5 obs:12)	0.511 (max: 0.93 obs:4)
Garden II			0.194 (max: 0.3 obs:3)	
Garden J		2.006 (max: 7.59 obs:5)	0.199 (max: 0.45 obs:12)	0.337 (max: 0.6 obs:3)
Garden K		1.6 (max: 1.7 obs:3)		
Garden KK			0.175 (max: 0.22 obs:2)	0.297 (max: 0.47 obs:4)
Garden L		0.577 (max: 1.03 obs:3)		
Garden M		0.35 (max: 0.4 obs:2)		
Garden N		2.427 (max: 10.5 obs:6)		
Garden O		0.35 (max: 0.4 obs:2)	0.225 (max: 0.55 obs:11)	0.333 (max: 0.33 obs:1)
Garden P		1.673 (max: 4.34 obs:4)	0.327 (max: 1 obs:13)	0.268 (max: 0.4 obs:4)
Garden PP			0.18 (max: 0.3 obs:4)	0.233 (max: 0.23 obs:1)
Garden Q		0.533 (max: 0.6 obs:3)	0.1 (max: 0.1 obs:1)	
Garden R		1.7 (max: 3.3 obs:3)		
Garden S		0.4 (max: 0.4 obs:1)		

Table A3.4 Summary of Garden Vegetable Concentrations (mg/kg(wet)) (Cont'd)

Location	1967-1974	1975-1984	1985-1999	Current
Garden T			0.268 (max: 0.63 obs:9)	0.27 (max: 0.27 obs:1)
Garden TT			0.135 (max: 0.2 obs:5)	0.1 (max: 0.1 obs:1)
Garden U			0.19 (max: 0.19 obs:1)	
Garden V			1.17 (max: 1.17 obs:1)	
Garden W			0.221 (max: 0.83 obs:12)	0.27 (max: 0.4 obs:4)
Garden X			0.815 (max: 3.84 obs:8)	
Garden Y			0.454 (max: 0.7 obs:7)	
Garden Z			1.31 (max: 1.31 obs:1)	
Thallium in ROOT Vegetables				
Garden C			0.018 (max: 0.04 obs:7)	0.022 (max: 0.04 obs:3)
Garden D			0.02 (max: 0.03 obs:2)	0.02 (max: 0.03 obs:3)
Garden E			0.011 (max: 0.02 obs:7)	
Garden F			0.002 (max: 0 obs:1)	
Garden G			0.01 (max: 0.01 obs:2)	
Garden H			0.012 (max: 0.02 obs:7)	
Garden HH			0.008 (max: 0.01 obs:2)	
Garden I			0.012 (max: 0.04 obs:7)	0.011 (max: 0.02 obs:4)
Garden II			0.008 (max: 0.01 obs:2)	
Garden J			0.024 (max: 0.06 obs:5)	0.015 (max: 0.02 obs:3)
Garden KK			0.02 (max: 0.02 obs:2)	0.009 (max: 0.01 obs:4)
Garden O			0.025 (max: 0.09 obs:8)	0.027 (max: 0.03 obs:1)
Garden P			0.018 (max: 0.04 obs:9)	0.011 (max: 0.02 obs:4)
Garden PP			0.012 (max: 0.02 obs:3)	0.01 (max: 0.01 obs:1)
Garden T			0.013 (max: 0.03 obs:6)	0.005 (max: 0.01 obs:1)
Garden TT			0.023 (max: 0.05 obs:4)	0.005 (max: 0.01 obs:1)
Garden W			0.011 (max: 0.03 obs:9)	0.015 (max: 0.02 obs:3)
Garden X			0.022 (max: 0.05 obs:3)	
Garden Y			0.017 (max: 0.02 obs:4)	

Table A3.4 Summary of Garden Vegetable Concentrations (mg/kg(wet)) (Cont'd)

Location	1967-1974	1975-1984	1985-1999	Current
Zinc in ROOT Vegetables				
Garden A	8.095 (max: 17.5 obs:4)	16 (max: 43.5 obs:10)	3.78 (max: 8.07 obs:5)	
Garden B	11.8 (max: 22.9 obs:3)	6.334 (max: 11.4 obs:9)		
Garden C	3.9 (max: 6.43 obs:4)	4.33 (max: 7.75 obs:10)	5.012 (max: 14 obs:13)	4.983 (max: 8.4 obs:3)
Garden C-3	2.3 (max: 2.3 obs:1)	11.5 (max: 36 obs:4)		
Garden C-5	2.87 (max: 3.56 obs:2)	3.085 (max: 4.48 obs:2)		
Garden D			3.25 (max: 3.4 obs:2)	4.913 (max: 6.1 obs:4)
Garden Dorig	3.3 (max: 5.13 obs:2)	5.155 (max: 8.87 obs:10)	4.857 (max: 6.5 obs:3)	
Garden E	4.993 (max: 9.93 obs:6)	6.257 (max: 15 obs:12)	2.97 (max: 4.13 obs:12)	
Garden F	4.42 (max: 4.55 obs:2)	6.3 (max: 16.5 obs:10)	6.824 (max: 8.81 obs:5)	
Garden G	2.87 (max: 2.87 obs:1)	3.201 (max: 4.56 obs:9)	3.422 (max: 4.63 obs:8)	
Garden H		4.402 (max: 6.07 obs:6)	4.159 (max: 7.07 obs:8)	
Garden HH			5.2 (max: 6.5 obs:4)	
Garden I	3.91 (max: 3.91 obs:1)	6.977 (max: 29.2 obs:9)	4.639 (max: 17 obs:12)	6.215 (max: 6.93 obs:4)
Garden II			4.925 (max: 6.1 obs:4)	
Garden J		3.648 (max: 5.27 obs:5)	2.331 (max: 4.66 obs:10)	2.797 (max: 3.6 obs:3)
Garden K		3.303 (max: 4.56 obs:3)		
Garden KK			2.965 (max: 3.23 obs:2)	3.61 (max: 4.6 obs:4)
Garden L		2.66 (max: 4.43 obs:3)		
Garden M		1.69 (max: 1.69 obs:1)		
Garden N		3.298 (max: 5.41 obs:6)		
Garden O		3.11 (max: 3.22 obs:2)	3.366 (max: 4.86 obs:11)	3.47 (max: 3.47 obs:1)
Garden P		12.09 (max: 22.5 obs:4)	5.313 (max: 11.8 obs:12)	4.288 (max: 7.3 obs:4)
Garden PP			3.08 (max: 3.8 obs:5)	2.8 (max: 2.8 obs:1)
Garden Q		3.133 (max: 4.89 obs:3)	1.93 (max: 1.93 obs:1)	
Garden R		18.4 (max: 32.4 obs:3)		
Garden S		5.95 (max: 5.95 obs:1)		
Garden T			3.014 (max: 4.97 obs:7)	5.6 (max: 5.6 obs:1)
Garden TT			3.844 (max: 5 obs:5)	3.23 (max: 3.23 obs:1)
Garden U			3.49 (max: 3.49 obs:1)	
Garden V			3.97 (max: 3.97 obs:1)	

Table A3.4 Summary of Garden Vegetable Concentrations (mg/kg(wet)) (Cont'd)

Location	1967-1974	1975-1984	1985-1999	Current
Garden W			2.348 (max: 3.94 obs:11)	2.985 (max: 5.6 obs:4)
Garden X			3.771 (max: 5.84 obs:8)	
Garden Y			4.701 (max: 5.96 obs:8)	
Garden Z			7.31 (max: 7.31 obs:1)	

The vegetable concentrations were summarized by the five study areas and four time periods. Concentrations of all measured values were included in the summary. The summaries included the total number of measurements, the mean concentration, the UCL of the mean and the maximum single measurement from within the study area. The EPCs based on measured vegetable concentrations were derived from these values. The EPC best estimate was set to the mean measured concentration. The EPC upper bound was set to the UCL of the mean for the core communities and to the maximum measured concentration for the two most exposed areas (Townsite #2 and Lower Belledune). Table A3.5 shows these concentrations.

Table A3.5 Summary of Garden Vegetable Concentrations Used in HHRA (mg/kg(wet))

Analyte	Exposure Area	Number of Measurements	Mean	Maximum	EPC Best Estimate	EPC Upper Bound
OTHER Vegetables in 2003 Time Period						
Arsenic	Belledune	40	0.073	0.15	0.073	0.081
Arsenic	Lower Belledune	4	0.055	0.06	0.055	0.06
Arsenic	Pointe-Verte	4	0.078	0.12	0.078	0.123
Arsenic	Townsite	7	0.077	0.12	0.077	0.12
Cadmium	Belledune	39	0.058	0.34	0.058	0.081
Cadmium	Lower Belledune	4	0.023	0.04	0.023	0.04
Cadmium	Pointe-Verte	4	0.04	0.12	0.04	0.125
Cadmium	Townsite	7	0.091	0.34	0.091	0.34
Lead	Belledune	38	0.819	6.3	0.819	1.168
Lead	Lower Belledune	4	0.535	0.9	0.535	0.9
Lead	Pointe-Verte	4	1.237	2.6	1.237	2.823
Lead	Townsite	7	1.651	6.3	1.651	6.3
Thallium	Belledune	37	0.011	0.07	0.011	0.015
Thallium	Lower Belledune	4	0.014	0.02	0.014	0.02
Thallium	Pointe-Verte	4	0.013	0.03	0.013	0.031

Table A3.5 Summary of Garden Vegetable Concentrations Used in HHRA (mg/kg(wet)) (Cont'd)

Analyte	Exposure Area	Number of Measurements	Mean	Maximum	EPC Best Estimate	EPC Upper Bound
Thallium	Townsite	4	0.026	0.07	0.026	0.07
Zinc	Belledune	39	6.346	33.9	6.346	8.2
Zinc	Lower Belledune	4	4.798	7.8	4.798	7.8
Zinc	Pointe-Verte	4	4.995	6.4	4.995	7.653
Zinc	Townsite	7	5.72	15.8	5.72	15.8
OTHER Vegetables in 1985-1999 Time Period						
Arsenic	Belledune	196	0.075	1.31	0.075	0.093
Arsenic	Lower Belledune	15	0.131	0.63	0.131	0.63
Arsenic	Lower Belledune	5	0.138	0.5	0.138	0.5
Arsenic	Pointe-Verte	32	0.74	21.8	0.74	2.126
Arsenic	Townsite	23	0.076	0.265	0.076	0.265
Cadmium	Belledune	213	0.134	1.63	0.134	0.164
Cadmium	Lower Belledune	16	0.318	1.5	0.318	1.5
Cadmium	Lower Belledune	5	0.108	0.252	0.108	0.252
Cadmium	Pointe-Verte	34	0.096	0.37	0.096	0.135
Cadmium	Townsite	25	0.131	0.7	0.131	0.7
Lead	Belledune	207	0.728	9.96	0.728	0.856
Lead	Lower Belledune	17	1.348	9.96	1.348	9.96
Lead	Lower Belledune	5	1.594	4.14	1.594	4.14
Lead	Pointe-Verte	34	2.358	56.1	2.358	5.682
Lead	Townsite	25	0.904	4.8	0.904	4.8
OTHER Vegetables in 1975-1984 Time Period						
Arsenic	Belledune	131	0.226	3.27	0.226	0.293
Arsenic	Lower Belledune	35	0.331	3.27	0.331	3.27
Arsenic	Lower Belledune	17	0.294	1.67	0.294	1.67
Arsenic	Petit-Rocher	8	0.199	0.43	0.199	0.308
Arsenic	Pointe-Verte	16	0.232	0.78	0.232	0.358
Arsenic	Townsite	15	0.142	0.61	0.142	0.61
Cadmium	Belledune	155	0.356	4.44	0.356	0.466
Cadmium	Lower Belledune	37	0.795	4.44	0.795	4.44
Cadmium	Lower Belledune	20	0.259	1.54	0.259	1.54
Cadmium	Petit-Rocher	10	0.124	0.25	0.124	0.184
Cadmium	Pointe-Verte	21	0.262	1.72	0.262	0.453
Cadmium	Townsite	20	0.211	0.85	0.211	0.85
Lead	Belledune	153	3.21	45.6	3.21	3.984

Table A3.5 Summary of Garden Vegetable Concentrations Used in HHRA (mg/kg(wet)) (Cont'd)

Analyte	Exposure Area	Number of Measurements	Mean	Maximum	EPC Best Estimate	EPC Upper Bound
Lead	Lower Belledune	36	5.092	45.6	5.092	45.6
Lead	Lower Belledune	19	3.419	12.5	3.419	12.5
Lead	Petit-Rocher	10	2.39	8.87	2.39	4.226
Lead	Pointe-Verte	21	2.484	8.32	2.484	3.646
Lead	Townsite	20	2.926	22.4	2.926	22.4
OTHER Vegetables in 1967-1974 Time Period						
Cadmium	Belledune	31	0.075	0.56	0.075	0.124
Cadmium	Lower Belledune	15	0.05	0.2	0.05	0.2
Cadmium	Lower Belledune	3	0.04	0.08	0.04	0.08
Cadmium	Pointe-Verte	2	0.04	0.06	0.04	0.294
Cadmium	Townsite	7	0.107	0.53	0.107	0.53
Lead	Belledune	22	1.313	11.2	1.313	2.405
Lead	Lower Belledune	10	0.458	2.36	0.458	2.36
Lead	Lower Belledune	2	1.475	2.49	1.475	2.49
Lead	Pointe-Verte	2	0.19	0.31	0.19	1.715
Lead	Townsite	4	4.333	11.2	4.333	11.2
ROOT Vegetables in 2003 Time Period						
Arsenic	Belledune	25	0.065	0.13	0.065	0.077
Arsenic	Lower Belledune	3	0.077	0.11	0.077	0.11
Arsenic	Pointe-Verte	4	0.07	0.09	0.07	0.113
Arsenic	Townsite	4	0.058	0.08	0.058	0.08
Cadmium	Belledune	26	0.104	0.33	0.104	0.131
Cadmium	Lower Belledune	3	0.17	0.18	0.17	0.18
Cadmium	Pointe-Verte	4	0.068	0.08	0.068	0.088
Cadmium	Townsite	4	0.078	0.083	0.078	0.083
Lead	Belledune	26	0.339	0.93	0.339	0.415
Lead	Lower Belledune	3	0.423	0.5	0.423	0.5
Lead	Pointe-Verte	4	0.297	0.467	0.297	0.557
Lead	Townsite	4	0.35	0.5	0.35	0.5
Thallium	Belledune	24	0.015	0.04	0.015	0.019
Thallium	Lower Belledune	3	0.022	0.04	0.022	0.04
Thallium	Pointe-Verte	4	0.009	0.01	0.009	0.013
Thallium	Townsite	3	0.02	0.03	0.02	0.03
Zinc	Belledune	26	4.309	8.4	4.309	5.08
Zinc	Lower Belledune	3	4.983	8.4	4.983	8.4

Table A3.5 Summary of Garden Vegetable Concentrations Used in HHRA (mg/kg(wet)) (Cont'd)

Analyte	Exposure Area	Number of Measurements	Mean	Maximum	EPC Best Estimate	EPC Upper Bound
Zinc	Pointe-Verte	4	3.61	4.6	3.61	5.287
Zinc	Townsite	4	4.913	6.1	4.913	6.1
ROOT Vegetables in 1985-1999 Time Period						
Arsenic	Belledune	134	0.041	0.16	0.041	0.047
Arsenic	Lower Belledune	13	0.043	0.11	0.043	0.11
Arsenic	Lower Belledune	3	0.037	0.06	0.037	0.06
Arsenic	Pointe-Verte	18	0.092	0.5	0.092	0.164
Arsenic	Townsite	13	0.056	0.15	0.056	0.15
Cadmium	Belledune	133	0.157	0.52	0.157	0.178
Cadmium	Lower Belledune	14	0.224	0.49	0.224	0.49
Cadmium	Lower Belledune	3	0.186	0.25	0.186	0.25
Cadmium	Pointe-Verte	19	0.135	0.34	0.135	0.169
Cadmium	Townsite	13	0.121	0.17	0.121	0.17
Lead	Belledune	138	0.272	1.36	0.272	0.309
Lead	Lower Belledune	14	0.48	1.36	0.48	1.36
Lead	Lower Belledune	3	0.41	0.53	0.41	0.53
Lead	Pointe-Verte	19	0.535	3.84	0.535	0.943
Lead	Townsite	14	0.288	0.7	0.288	0.7
ROOT Vegetables in 1975-1984 Time Period						
Arsenic	Belledune	78	0.106	1.15	0.106	0.138
Arsenic	Lower Belledune	19	0.145	1.15	0.145	1.15
Arsenic	Lower Belledune	10	0.085	0.2	0.085	0.2
Arsenic	Petit-Rocher	5	0.044	0.08	0.044	0.078
Arsenic	Pointe-Verte	7	0.124	0.27	0.124	0.217
Arsenic	Townsite	11	0.118	0.44	0.118	0.44
Cadmium	Belledune	84	0.117	0.92	0.117	0.144
Cadmium	Lower Belledune	19	0.102	0.38	0.102	0.38
Cadmium	Lower Belledune	10	0.121	0.4	0.121	0.4
Cadmium	Petit-Rocher	6	0.057	0.12	0.057	0.093
Cadmium	Pointe-Verte	9	0.077	0.24	0.077	0.128
Cadmium	Townsite	12	0.122	0.34	0.122	0.34
Lead	Belledune	84	1.382	14.8	1.382	1.839
Lead	Lower Belledune	20	1.547	14.8	1.547	14.8
Lead	Lower Belledune	10	1.471	4.19	1.471	4.19
Lead	Petit-Rocher	6	2.427	10.5	2.427	6.592

Table A3.5 Summary of Garden Vegetable Concentrations Used in HHRA (mg/kg(wet)) (Cont'd)

Analyte	Exposure Area	Number of Measurements	Mean	Maximum	EPC Best Estimate	EPC Upper Bound
Lead	Pointe-Verte	9	0.731	1.68	0.731	1.071
Lead	Townsite	11	1.142	3.56	1.142	3.56
ROOT Vegetables in 1967-1974 Time Period						
Cadmium	Belledune	18	0.127	0.47	0.127	0.203
Cadmium	Lower Belledune	7	0.047	0.12	0.047	0.12
Cadmium	Lower Belledune	2	0.06	0.09	0.06	0.09
Cadmium	Pointe-Verte	1	0.05	0.05	0.05	0.05
Cadmium	Townsite	6	0.29	0.47	0.29	0.47
Lead	Belledune	10	0.308	0.53	0.308	0.382
Lead	Lower Belledune	4	0.288	0.37	0.288	0.37
Lead	Lower Belledune	1	0.29	0.29	0.29	0.29
Lead	Pointe-Verte	1	0.17	0.17	0.17	0.17
Lead	Townsite	2	0.38	0.53	0.38	0.53

A3.1.1 Data Gaps in Measured Data

There were a number of data gaps based on the measured data. First, there were no measurements for dioxins and furans, chromium and mercury for the current period.

Measured vegetable concentrations from Petit-Rocher were not available for most years. Pointe-Verte EPCs were used for Petit-Rocher EPCs for those years when measurements were not available from Petit-Rocher. This is expected to overestimate the vegetable concentrations in Petit-Rocher.

Arsenic measurements were not available from the 1967-1974 time period. To account for this, arsenic concentrations for 1967-1974 were set equal to the EPC concentrations during 1975-1984 from the corresponding communities. It is uncertain whether this overestimates or underestimates the measured concentrations. During the 1975-1984 time period, the concentrations were lower than in 1967-1974 time period but the soil concentrations were higher than in 1967-1974.

A3.2 Relationships between Backyard Vegetable Concentrations

This section describes the data used to fit the relationship between measured vegetable concentrations and measured soil concentrations. Figures showing the fitted relationships are presented as well.

Table A3.6 shows the data used to develop the relationship. The data presented in the table are the means of the measured concentrations for each time period. It should be noted that these numbers can also be found in other tables but were rearranged here for ease of viewing.

Table A3.6 Mean Measured Concentrations used in Relationship between Vegetables and Soil Concentrations

Location	Measured Soil mg/kg(dry)	Mean Measured Other Vegetables mg/kg(wet)	Mean Measured Root Vegetables mg/kg(wet)
Arsenic in 1985-1999 Time Period			
Garden A	22.2	0.32	0.0575
Garden C	34.389	0.13093	0.04533
Garden D	20.435	0.04	0.07
Garden Dorig	26.97	0.138	0.03667
Garden E	25.5062	0.0775	0.05382
Garden F	36.08	0.03371	0.01975
Garden G	22.0371	1.59664	0.11286
Garden I	22.4872	0.06243	0.04345
Garden J	19.2697	0.04547	0.0252
Garden KK	24.39	0.10167	0.1215
Garden O	18.7747	0.16431	0.0275
Garden P	14.119	0.05635	0.05285
Garden PP	23.7925	0.12	0.09
Garden T	16.31	0.0609	0.03433
Garden U	28.7837	0.0175	0.01
Garden W	11.2331	0.05452	0.04433
Garden X	21.0956	0.069	0.07663
Garden Y	27.7147	0.06685	0.02029
Arsenic in Current Time Period			
Garden C	24.4875	0.055	0.07667
Garden D	17.045	0.07714	0.0575
Garden I	20.305	0.08167	0.06325
Garden J	13.0825	0.06	0.06333
Garden KK	17.9	0.0775	0.07
Garden P	13.2075	0.058	0.04667
Garden PP	4.88	0.09	0.11

Table A3.6 Mean Measured Concentrations used in Relationship between Vegetables and Soil Concentrations (Cont'd)

Location	Measured Soil mg/kg(dry)	Mean Measured Other Vegetables mg/kg(wet)	Mean Measured Root Vegetables mg/kg(wet)
Garden T	15.4	0.115	0.06
Garden W	13.3275	0.07875	0.04625
Cadmium in 1985-1999 Time Period			
Garden A	1.5	0.44337	0.2074
Garden C	1.77056	0.3179	0.22549
Garden D	1.54	0.01	0.141
Garden Dorig	1.16667	0.1078	0.186
Garden E	1.27946	0.13594	0.11709
Garden F	0.93	0.3191	0.3574
Garden G	1.24429	0.08625	0.1105
Garden I	0.58436	0.07168	0.07217
Garden J	0.37308	0.09174	0.0673
Garden KK	0.665	0.04083	0.1055
Garden O	0.85867	0.16161	0.17273
Garden P	0.44286	0.1067	0.20492
Garden PP	0.63889	0.008	0.05575
Garden T	0.518	0.10292	0.12204
Garden U	1.083	0.0155	0.07
Garden W	0.41949	0.06148	0.0724
Garden X	0.69889	0.1624	0.17438
Garden Y	0.716	0.18836	0.31271
Cadmium in Current Time Period			
Garden C	1.964	0.0225	0.17
Garden D	1.624	0.09071	0.07825
Garden I	0.4375	0.06583	0.16625
Garden J	0.3315	0.04714	0.04333
Garden KK	0.855	0.04	0.0675
Garden P	0.375	0.076	0.12
Garden PP	0.25	0.02	0.02
Garden T	0.25	0.01	0.14
Garden W	0.375	0.04875	0.0675
Lead in 1985-1999 Time Period			
Garden A	149.333	4.12375	0.798
Garden C	130.708	1.34804	0.42721
Garden D	105.835	0.46	0.265
Garden Dorig	80.29	1.594	0.41
Garden E	114.951	0.9225	0.29194
Garden F	82.36	0.48778	0.278
Garden G	117.447	3.97313	0.3875
Garden I	69.7862	0.55574	0.22667
Garden J	30.0977	0.58556	0.19944
Garden KK	52.51	0.68167	0.175
Garden O	60.7363	0.41539	0.22455
Garden P	49.4344	0.578	0.32692
Garden PP	57.7	0.12	0.18
Garden T	42.84	0.81397	0.26778

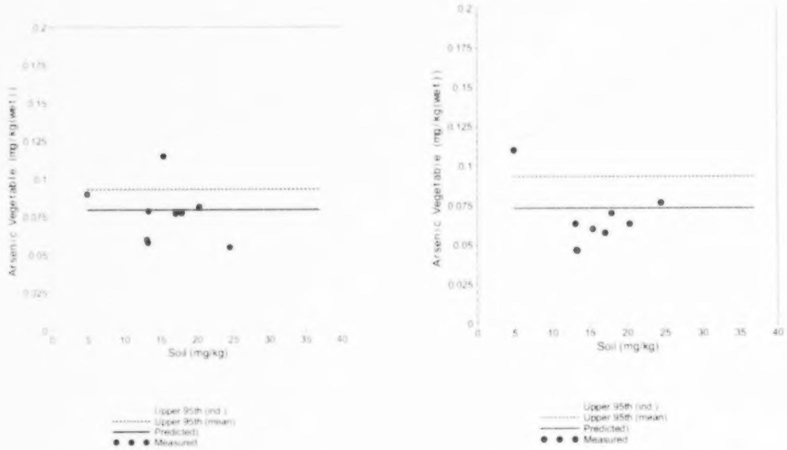
Table A3.6 Mean Measured Concentrations used in Relationship between Vegetables and Soil Concentrations (Cont'd)

Location	Measured Soil mg/kg(dry)	Mean Measured Other Vegetables mg/kg(wet)	Mean Measured Root Vegetables mg/kg(wet)
Garden U	62.351	0.32	0.19
Garden W	37.4426	0.63417	0.22058
Garden X	63.3333	1.188	0.815
Garden Y	64.4993	0.80692	0.45429
Lead in Current Time Period			
Garden C	134.725	0.535	0.42333
Garden D	97.625	1.65143	0.35
Garden I	42.9	0.644	0.51075
Garden J	23.45	0.44286	0.33667
Garden KK	51.225	1.2375	0.29675
Garden P	37.7	0.612	0.2675
Garden PP	20	0.23	0.233
Garden T	30.8	0.3	0.27
Garden W	24.9	0.9375	0.27
Thallium in Current Time Period			
Garden C	1.01	0.01375	0.02167
Garden D	0.8775	0.02625	0.02
Garden I	0.4225	0.00917	0.01125
Garden J	0.50775	0.00643	0.015
Garden KK	0.50625	0.0125	0.00875
Garden P	0.382	0.009	0.01125
Garden PP	0.6	0.01	0.01
Garden T	0.6	0.015	0.005
Garden W	0.535	0.00875	0.015
Zinc in Current Time Period			
Garden C	187.775	4.7975	4.98333
Garden D	190.175	5.72	4.9125
Garden I	204.55	6.49	6.215
Garden J	133.475	3.94143	2.79667
Garden KK	121.225	4.995	3.61
Garden P	162.25	6.53	4.2875
Garden PP	96.3	6.23	2.8
Garden T	74.1	3.73	5.6
Garden W	147.375	9.8925	2.985

The relationship was fit using weighted regression to address the higher statistical variation associated with increasing concentrations. The weights were divided the soil concentration squared. The parameter estimates for the intercept and for the incremental due to soil concentration were constrained to be positive values.

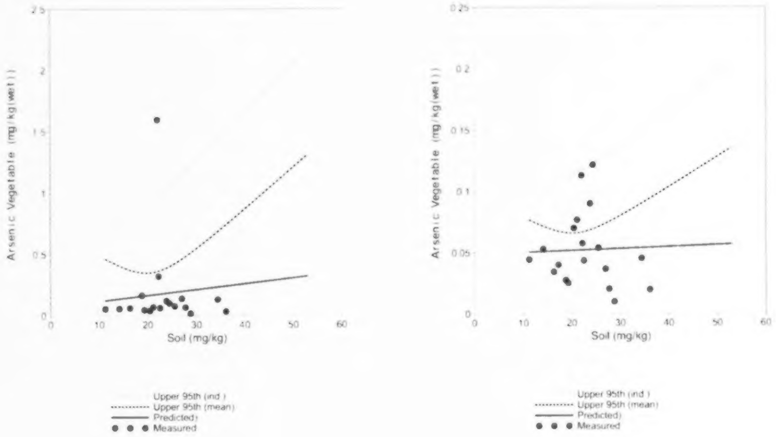
The following figures show the empirical relationships between vegetable concentrations and soil concentration. Cadmium and lead have obvious patterns of increasing vegetable concentration with increase soil concentration particularly for the 1985-1999 period where there are more measurement locations. Trends are less apparent for arsenic and zinc. It is possible that use of garden pesticide containing arsenic may have influenced the arsenic relationships.

Figure A18 Arsenic Relationships between Backyard Produce and Soil



a) Other Vegetables (Current)

b) Root Vegetables (Current)

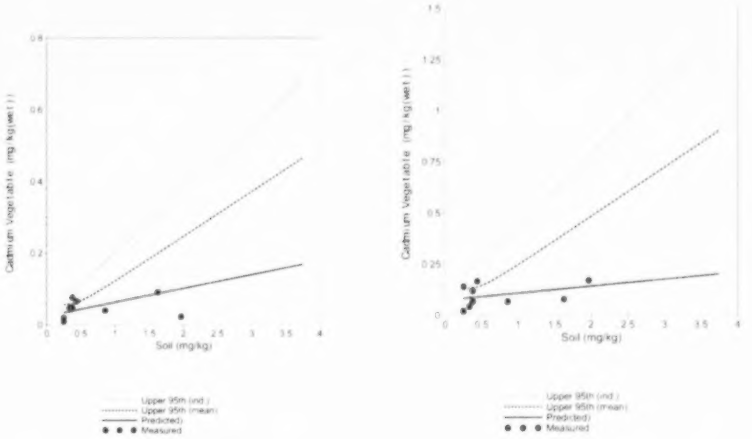


c) Other Vegetables (1985-1999)

d) Root Vegetables (1985-1999)

Figure A19 Cadmium Relationships Between Backyard Produce and Soil

a) Other Vegetables (Current) b) Root Vegetables (Current)



c) Other Vegetables(1985-1999) d) Root Vegetables (1985-1999)

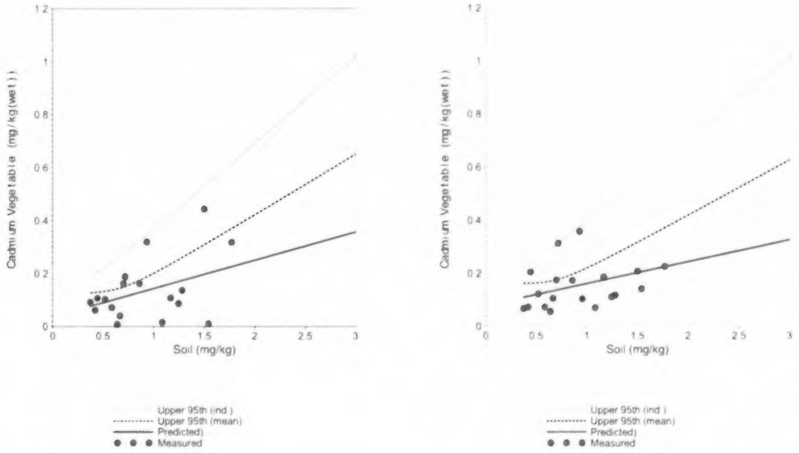
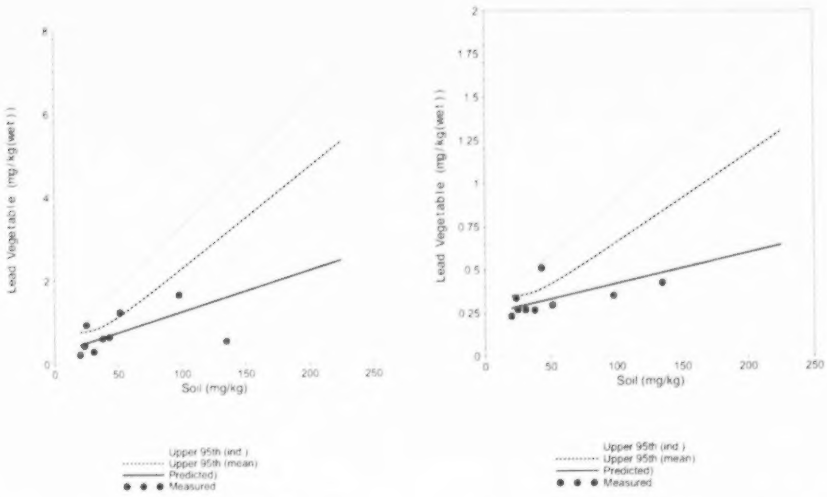


Figure A20 Lead Relationships Between Backyard Produce and Soil



a) Other Vegetables (Current)

b) Root Vegetables (Current)

c) Other Vegetables (1985-1999)

d) Root Vegetables (1985-1999)

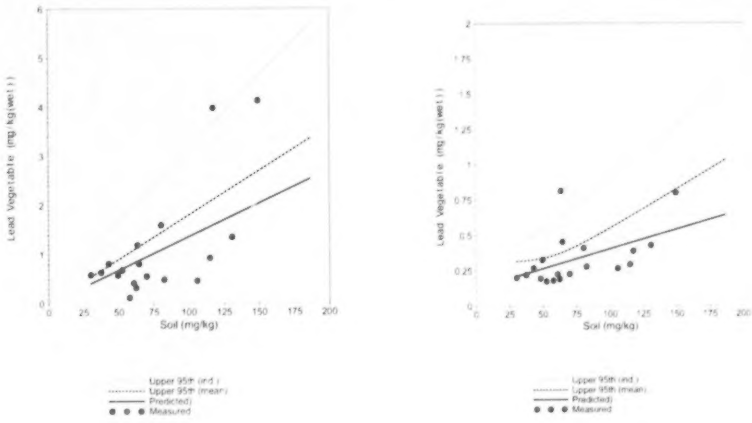
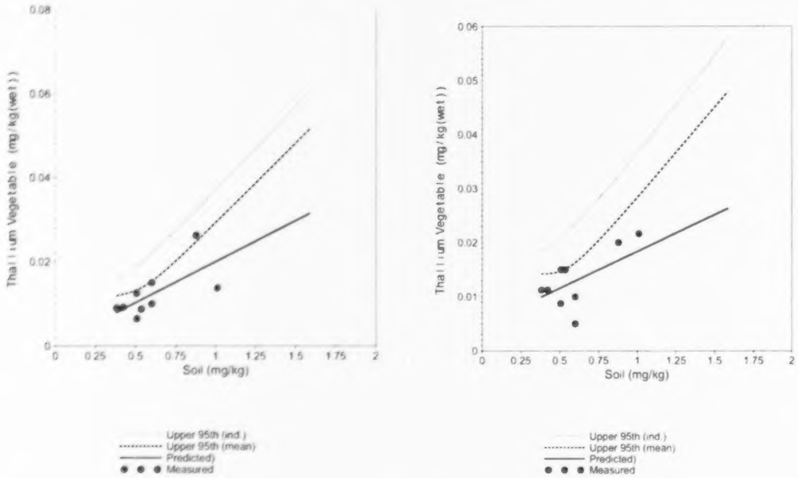
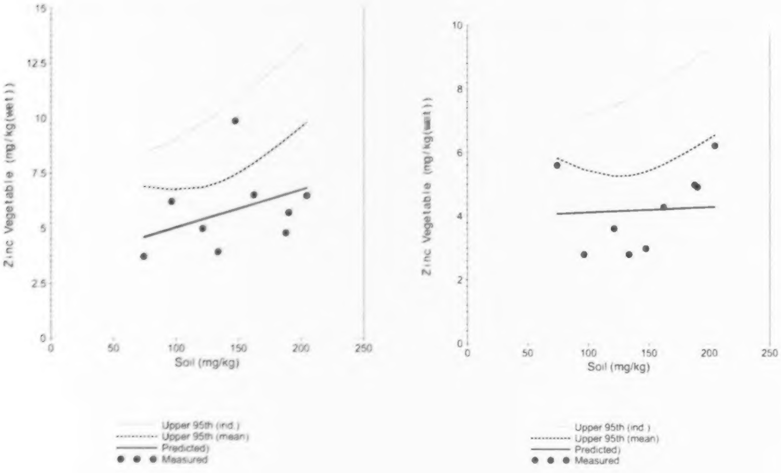


Figure A21 Thallium and Zinc Relationships Between Backyard Produce and Soil

a) Thallium in Other Vegetables b) Thallium in Root Vegetables



c) Zinc in Other Vegetables d) Zinc in Root Vegetables



A3.3 Uncertainties

Uncertainties surrounding the backyard produce data are as follows:

- Garden vegetables were grouped into categories of other (i.e., aboveground vegetables) and root vegetables; however, this may have introduced some uncertainty regarding concentrations in specific types of vegetables. The COPC concentrations in specific vegetables may be higher or lower than the group average.
- There were relatively few garden sampling locations within the study areas; therefore the mean concentration from these locations may not have been representative of the mean concentration in all gardens within the particular study area. The true mean concentration may be higher or lower than the average of measured concentration for concentrations based on measurement data alone.
- In some cases, there were no measurements for a given time period or study area. For study areas without measurements, garden vegetable concentrations from another study area closer to the industrial area were used. In most cases, this would have overestimated vegetable concentrations because a value was taken from an area likely to have higher vegetable concentrations.
- Garden vegetable concentrations for the 1967-1974 time period were set equal to the 1975-1984 time period concentrations since no measurement data were available. Although soil concentrations were likely lower in the earlier period, the air concentrations were higher. The effect on garden vegetable concentrations is uncertain; concentrations in 1967-1974 may have been higher or lower than the concentrations in 1975-1984, thus exposure would have been either over- or under-estimated.
- The empirical relationship between vegetation and soil facilitates prediction of vegetable concentrations across the study area, so that the assessment can provide estimates of mean vegetable concentrations and a range of vegetable concentrations. The uncertainty in this approach is statistically quantifiable by the upper (and lower) confidence limits of the mean concentration.

A4.0 Seafood

The following maps show the calculated means of measurements at various locations (since 2003) in mg/kg wet weight. The maps do not show concentrations in lobster digestive gland. The data indicates that there are gradients associated with distance from the smelter facility.

Figure A22 Map Showing Concentrations of Arsenic in Lobster (mg/kg wet weight)

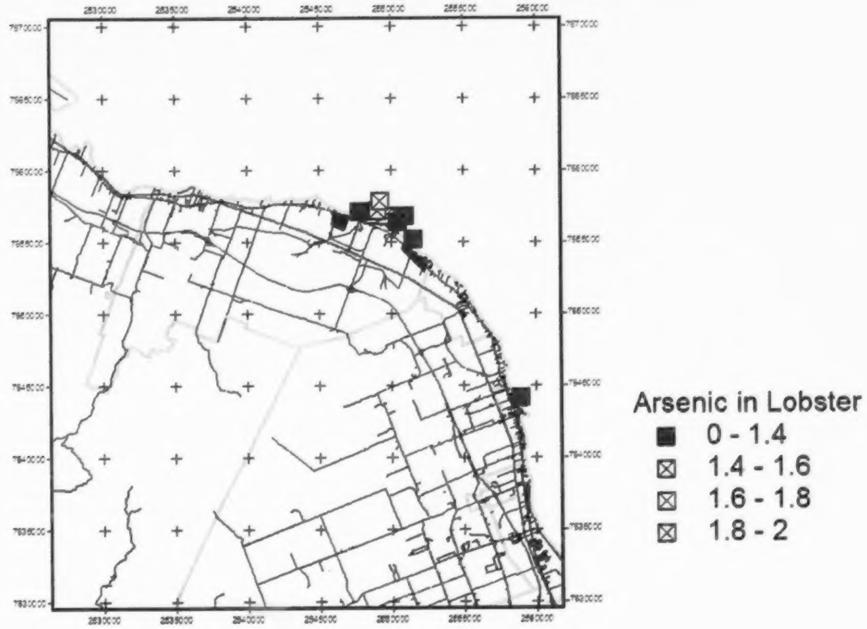


Figure A23 Map Showing Concentrations of Cadmium in Lobster and Mussels (mg/kg wet weight)

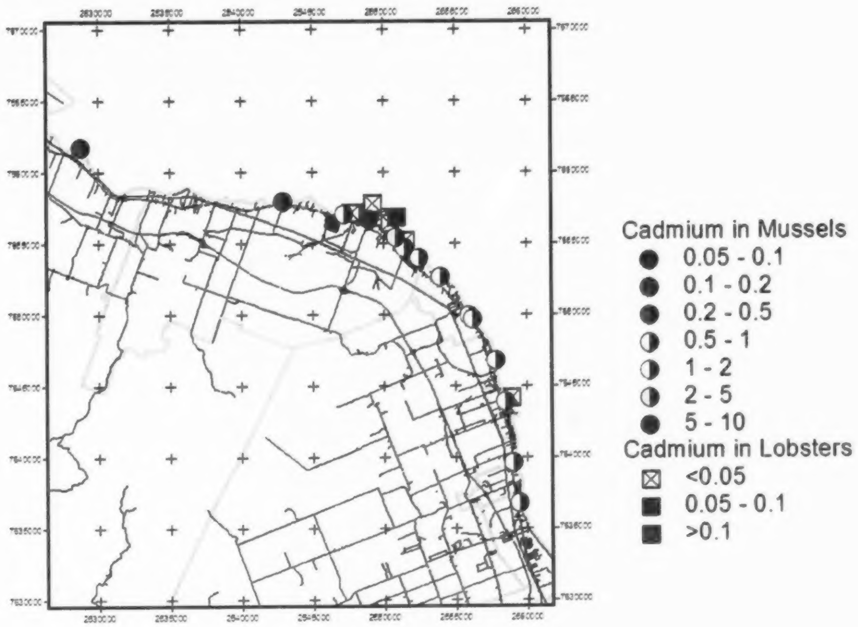


Figure A24 Map Showing Concentrations of Lead in Lobster and Mussels (mg/kg wet weight)

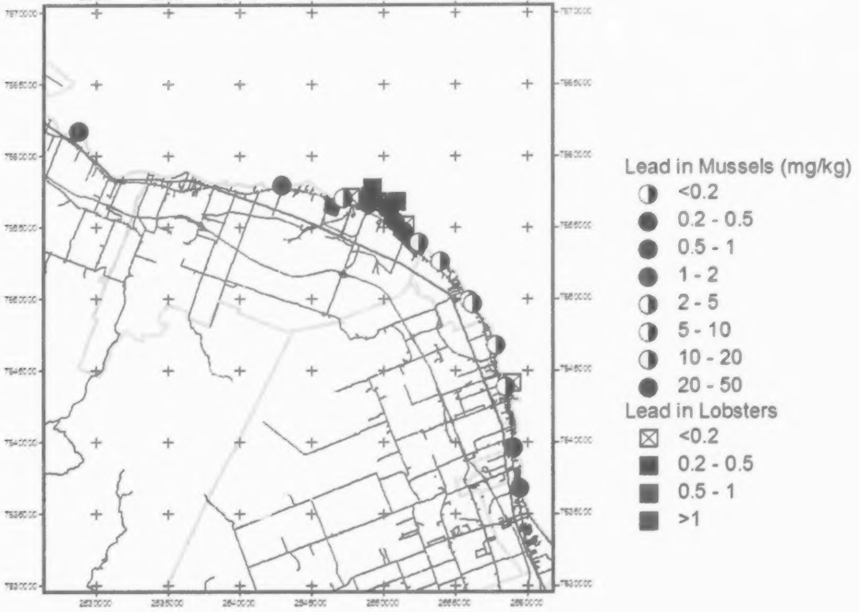


Figure A25 Map Showing Concentrations of Thallium in Lobster and Mussels (mg/kg wet weight)

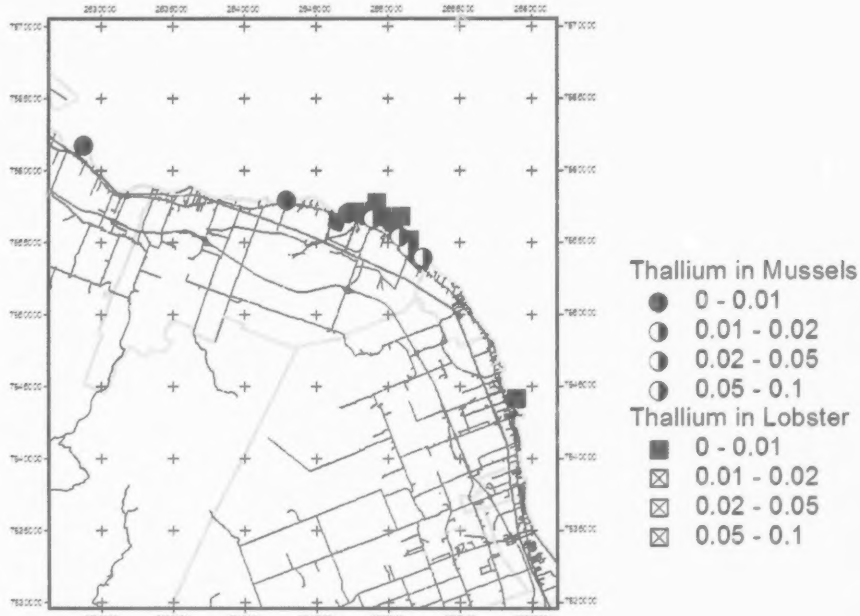


Table A4.1 shows lobster measurements by Noranda since 2000 (Brunswick Mining and Smelting Corporation, 2004e). Lobster sampling data typically included both concentrations in the tomallie or hepatopancreas, as well as in cooked "lobster meat," consisting of samples from the claws and/or abdomen. Data from lobster hepatopancreas were not included, as people do not typically consume this portion of the lobster. Lobster meat concentrations were analyzed instead. Not all reports specified that the lobster meat was cooked, but samples were used regardless. Lobsters sampled in the harbour were excluded from the samples as this areas is a closed fishery.

Lobster species were not always reported, but were assumed to be of the species *Homarus americanus*. All lobsters were assumed to be edible.

Table A4.1 Lobster Measurement Data (mg/kg wet) since 2000

Location	Easting	Northing	Media	Source	Statistic	Year	Arsenic	Cadmium	Lead	Thallium
CWIC	2548717	7656797	Lobster(meat)	Noranda2002Lobst		2000	3.3			
CWIC	2548717	7656797	Lobster(meat)	NorandaVarious	Geometric Mean	2000	0.68	0.050		
CWIC	2548717	7656797	Lobster(meat)	Noranda2002Lobst		2001	0.86			
CWIC	2548717	7656797	Lobster(meat)	NorandaVarious	Geometric Mean	2001	1.2	0.060		
CWIC	2548717	7656797	Lobster(meat)	NorandaVarious	Average	2002	0.88	0.070		
CWIC	2548717	7656797	Lobster(meat)	NorandaVarious	Geometric Mean	2002	0.60	0.050		
CWIC	2548717	7656797	Lobster(meat)	Noranda2003Appen	Geometric Mean	2003	1.3	0.019	0.57	0.010
CWIC	2548717	7656797	Lobster(meat)	Noranda2003Appen	Mean	2003	1.4	0.020	0.68	0.010
CWIC	2548717	7656797	Lobster(meat)	NorandaVarious	Average	2003	2.7	0.040	1.4	
CWIC	2548717	7656797	Lobster(meat)	NorandaVarious	Geometric Mean	2003	2.6	0.040	1.1	
Harbour East	2549586	7656735	Lobster(meat)	Noranda2002Lobst		2000	3.8			
Harbour East	2549586	7656735	Lobster(meat)	NorandaVarious	Geometric Mean	2000	0.71	0.050		
Harbour East	2549586	7656735	Lobster(meat)	Noranda2002Lobst		2001	1.1			
Harbour East	2549586	7656735	Lobster(meat)	NorandaVarious	Geometric Mean	2001	0.95	0.040		
Harbour East	2549586	7656735	Lobster(meat)	NorandaVarious	Average	2002	1.1	0.070		
Harbour East	2549586	7656735	Lobster(meat)	NorandaVarious	Geometric Mean	2002	0.69	0.050		
Harbour East	2549586	7656735	Lobster(meat)	Noranda2003Appen	Geometric Mean	2003	1.4	0.019	0.40	0.010
Harbour East	2549586	7656735	Lobster(meat)	Noranda2003Appen	Mean	2003	1.4	0.022	0.69	0.010
Harbour East	2549586	7656735	Lobster(meat)	NorandaVarious	Average	2003	2.8	0.050	1.4	
Harbour East	2549586	7656735	Lobster(meat)	NorandaVarious	Geometric Mean	2003	2.7	0.040	0.80	
Harbour West	2549058	7657076	Lobster(meat)	Noranda2002Lobst		2000	3.9			

Table A4.1 Lobster Measurement Data (mg/kg wet) since 2000 (Cont'd)

Location	Easting	Northing	Media	Source	Statistic	Year	Arsenic	Cadmium	Lead	Thallium
Harbour West	2549058	7657076	Lobster(meat)	NorandaVarious	Geometric Mean	2000	1.0	0.040		
Harbour West	2549058	7657076	Lobster(meat)	Noranda2002Lobst		2001	1.3			
Harbour West	2549058	7657076	Lobster(meat)	NorandaVarious	Geometric Mean	2001	1.3	0.050		
Harbour West	2549058	7657076	Lobster(meat)	NorandaVarious	Average	2002	1.6	0.060		
Harbour West	2549058	7657076	Lobster(meat)	NorandaVarious	Geometric Mean	2002	1.1	0.050		
Harbour West	2549058	7657076	Lobster(meat)	Noranda2003Appen	Geometric Mean	2003	1.4	0.023	0.55	0.010
Harbour West	2549058	7657076	Lobster(meat)	Noranda2003Appen	Mean	2003	1.4	0.025	0.73	0.010
Harbour West	2549058	7657076	Lobster(meat)	NorandaVarious	Average	2003	2.9	0.050	1.5	
Harbour West	2549058	7657076	Lobster(meat)	NorandaVarious	Geometric Mean	2003	2.8	0.050	1.1	
Heron Island	.	.	Lobster(meat)	Noranda2002Lobst		2000	3.1			
Heron Island	.	.	Lobster(meat)	NorandaVarious	Geometric Mean	2000	0.080	0.010		
Heron Island	.	.	Lobster(meat)	Noranda2002Lobst		2001	0.94			
Heron Island	.	.	Lobster(meat)	NorandaVarious	Geometric Mean	2001	0.17	0.020		
Heron Island	.	.	Lobster(meat)	NorandaVarious	Average	2002	0.92	0.070		
Heron Island	.	.	Lobster(meat)	NorandaVarious	Geometric Mean	2002	0.66	0.050		
Heron Island	.	.	Lobster(meat)	Noranda2003Appen	Geometric Mean	2003	1.2	0.011	0.086	0.010
Heron Island	.	.	Lobster(meat)	Noranda2003Appen	Mean	2003	1.2	0.012	0.10	0.010
Heron Island	.	.	Lobster(meat)	NorandaVarious	Average	2003	2.4	0.030	0.20	
Heron Island	.	.	Lobster(meat)	NorandaVarious	Geometric Mean	2003	2.3	0.030	0.17	
L1E	2550455	7656332	Lobster(meat)	Noranda2002Lobst		2000	3.8			
L1E	2550455	7656332	Lobster(meat)	NorandaVarious	Geometric Mean	2000	0.20	0.020		
L1E	2550455	7656332	Lobster(meat)	Noranda2002Lobst		2001	0.96			
L1E	2550455	7656332	Lobster(meat)	NorandaVarious	Geometric Mean	2001	0.27	0.030		
L1E	2550455	7656332	Lobster(meat)	NorandaVarious	Average	2002	0.87	0.070		
L1E	2550455	7656332	Lobster(meat)	NorandaVarious	Geometric Mean	2002	0.57	0.050		
L1E	2550455	7656332	Lobster(meat)	Noranda2003Appen	Geometric Mean	2003	1.2	0.011	0.14	0.010
L1E	2550455	7656332	Lobster(meat)	Noranda2003Appen	Mean	2003	1.2	0.011	0.19	0.010
L1E	2550455	7656332	Lobster(meat)	NorandaVarious	Average	2003	2.5	0.030	0.39	
L1E	2550455	7656332	Lobster(meat)	NorandaVarious	Geometric Mean	2003	2.4	0.020	0.28	
L1W	2547755	7657045	Lobster(meat)	Noranda2002Lobst		2000	3.1			
L1W	2547755	7657045	Lobster(meat)	NorandaVarious	Geometric Mean	2000	0.10	0.020		
L1W	2547755	7657045	Lobster(meat)	Noranda2002Lobst		2001	1.4			
L1W	2547755	7657045	Lobster(meat)	NorandaVarious	Geometric Mean	2001	0.27	0.030		
L1W	2547755	7657045	Lobster(meat)	NorandaVarious	Average	2002	0.36	0.020		
L1W	2547755	7657045	Lobster(meat)	NorandaVarious	Geometric Mean	2002	0.29	0.020		

Table A4.1 Lobster Measurement Data (mg/kg wet) since 2000 (Cont'd)

Location	Easting	Northing	Media	Source	Statistic	Year	Arsenic	Cadmium	Lead	Thallium
L1W	2547755	7657045	Lobster(meat)	Noranda2003Appen	Geometric Mean	2003	1.2	0.011	0.061	0.010
L1W	2547755	7657045	Lobster(meat)	Noranda2003Appen	Mean	2003	1.2	0.012	0.078	0.010
L1W	2547755	7657045	Lobster(meat)	NorandaVarious	Average	2003	2.5	0.030	0.16	
L1W	2547755	7657045	Lobster(meat)	NorandaVarious	Geometric Mean	2003	2.4	0.030	0.12	
L4E	2551541	7655090	Lobster(meat)	Noranda2002Lobst		2000	3.2			
L4E	2551541	7655090	Lobster(meat)	NorandaVarious	Geometric Mean	2000	0.20	0.020		
L4E	2551541	7655090	Lobster(meat)	Noranda2002Lobst		2001	1.9			
L4E	2551541	7655090	Lobster(meat)	NorandaVarious	Geometric Mean	2001	0.20	0.020		
L4E	2551541	7655090	Lobster(meat)	NorandaVarious	Average	2002	0.96	0.070		
L4E	2551541	7655090	Lobster(meat)	NorandaVarious	Geometric Mean	2002	0.64	0.050		
L4E	2551541	7655090	Lobster(meat)	Noranda2003Appen	Geometric Mean	2003	1.1	0.011	0.095	0.010
L4E	2551541	7655090	Lobster(meat)	Noranda2003Appen	Mean	2003	1.2	0.012	0.12	0.010
L4E	2551541	7655090	Lobster(meat)	NorandaVarious	Average	2003	2.3	0.020	0.24	
L4E	2551541	7655090	Lobster(meat)	NorandaVarious	Geometric Mean	2003	2.3	0.020	0.19	
LOBE	2549213	7657728	Lobster(meat)	Noranda2002Lobst		2000	3.5			
LOBE	2549213	7657728	Lobster(meat)	NorandaVarious	Geometric Mean	2000	0.25	0.020		
LOBE	2549213	7657728	Lobster(meat)	Noranda2002Lobst		2001	1.1			
LOBE	2549213	7657728	Lobster(meat)	NorandaVarious	Geometric Mean	2001	0.45	0.030		
LOBE	2549213	7657728	Lobster(meat)	NorandaVarious	Average	2002	1.3	0.070		
LOBE	2549213	7657728	Lobster(meat)	NorandaVarious	Geometric Mean	2002	0.83	0.060		
LOBE	2549213	7657728	Lobster(meat)	Noranda2003Appen	Geometric Mean	2003	1.3	0.013	0.12	0.010
LOBE	2549213	7657728	Lobster(meat)	Noranda2003Appen	Mean	2003	1.4	0.014	0.16	0.010
LOBE	2549213	7657728	Lobster(meat)	NorandaVarious	Average	2003	2.7	0.030	0.32	
LOBE	2549213	7657728	Lobster(meat)	NorandaVarious	Geometric Mean	2003	2.6	0.030	0.24	
New Habitat	2550920	7656735	Lobster(meat)	Noranda2002Lobst		2000	3.5			
New Habitat	2550920	7656735	Lobster(meat)	NorandaVarious	Geometric Mean	2000	0.21	0.020		
New Habitat	2550920	7656735	Lobster(meat)	Noranda2002Lobst		2001	1.1			
New Habitat	2550920	7656735	Lobster(meat)	NorandaVarious	Geometric Mean	2001	0.36	0.23		
New Habitat	2550920	7656735	Lobster(meat)	NorandaVarious	Average	2002	1.0	0.070		
New Habitat	2550920	7656735	Lobster(meat)	NorandaVarious	Geometric Mean	2002	0.69	0.060		
New Habitat	2550920	7656735	Lobster(meat)	Noranda2003Appen	Geometric Mean	2003	1.2	0.013	0.13	0.010
New Habitat	2550920	7656735	Lobster(meat)	Noranda2003Appen	Mean	2003	1.3	0.015	0.15	0.010
New Habitat	2550920	7656735	Lobster(meat)	NorandaVarious	Average	2003	2.6	0.030	0.30	
New Habitat	2550920	7656735	Lobster(meat)	NorandaVarious	Geometric Mean	2003	2.5	0.030	0.26	
Petit-Rocher	2558926	7644106	Lobster(meat)	Noranda2002Lobst		2000	3.3			
Petit-Rocher	2558926	7644106	Lobster(meat)	NorandaVarious	Geometric Mean	2000	0.16	0.025		
Petit-Rocher	2558926	7644106	Lobster(meat)	Noranda2002Lobst		2001	0.96			

Table A4.1 Lobster Measurement Data (mg/kg wet) since 2000 (Cont'd)

Location	Easting	Northing	Media	Source	Statistic	Year	Arsenic	Cadmium	Lead	Thallium
Petit-Rocher	2558926	7644106	Lobster(meat)	NorandaVarious	Geometric Mean	2001	0.22	0.024		
Petit-Rocher	2558926	7644106	Lobster(meat)	NorandaVarious	Average	2002	0.80	0.060		
Petit-Rocher	2558926	7644106	Lobster(meat)	NorandaVarious	Geometric Mean	2002	0.49	0.040		
Petit-Rocher	2558926	7644106	Lobster(meat)	Noranda2003Appen	Geometric Mean	2003	1.3	0.011	0.053	0.010
Petit-Rocher	2558926	7644106	Lobster(meat)	Noranda2003Appen	Mean	2003	1.4	0.011	0.058	0.010
Petit-Rocher	2558926	7644106	Lobster(meat)	NorandaVarious	Average	2003	2.7	0.020	0.12	
Petit-Rocher	2558926	7644106	Lobster(meat)	NorandaVarious	Geometric Mean	2003	2.7	0.020	0.11	
CWIC	2548717	7656797	Lobster(tom.)	NorandaVarious	Geometric Mean	2000		7.8		
CWIC	2548717	7656797	Lobster(tom.)	NorandaVarious	Geometric Mean	2001		5.8		
CWIC	2548717	7656797	Lobster(tom.)	NorandaVarious	Average	2002		13		
CWIC	2548717	7656797	Lobster(tom.)	NorandaVarious	Geometric Mean	2002		12		
CWIC	2548717	7656797	Lobster(tom.)	NorandaVarious	Average	2003		5.8		
CWIC	2548717	7656797	Lobster(tom.)	NorandaVarious	Geometric Mean	2003		5.1		
Harbour East	2549586	7656735	Lobster(tom.)	NorandaVarious	Geometric Mean	2000		13		
Harbour East	2549586	7656735	Lobster(tom.)	NorandaVarious	Geometric Mean	2001		11		
Harbour East	2549586	7656735	Lobster(tom.)	NorandaVarious	Average	2002		17		
Harbour East	2549586	7656735	Lobster(tom.)	NorandaVarious	Geometric Mean	2002		13		
Harbour East	2549586	7656735	Lobster(tom.)	NorandaVarious	Average	2003		12		
Harbour East	2549586	7656735	Lobster(tom.)	NorandaVarious	Geometric Mean	2003		9.4		
Harbour West	2549058	7657076	Lobster(tom.)	NorandaVarious	Geometric Mean	2000		7.5		
Harbour West	2549058	7657076	Lobster(tom.)	NorandaVarious	Geometric Mean	2001		13		
Harbour West	2549058	7657076	Lobster(tom.)	NorandaVarious	Average	2002		9.1		
Harbour West	2549058	7657076	Lobster(tom.)	NorandaVarious	Geometric Mean	2002		7.8		
Harbour West	2549058	7657076	Lobster(tom.)	NorandaVarious	Average	2003		11		
Harbour West	2549058	7657076	Lobster(tom.)	NorandaVarious	Geometric Mean	2003		8.0		
Heron Island	.	.	Lobster(tom.)	NorandaVarious	Geometric Mean	2000		3.5		
Heron Island	.	.	Lobster(tom.)	NorandaVarious	Geometric Mean	2001		4.4		
Heron Island	.	.	Lobster(tom.)	NorandaVarious	Average	2002		14		
Heron Island	.	.	Lobster(tom.)	NorandaVarious	Geometric Mean	2002		12		
Heron Island	.	.	Lobster(tom.)	NorandaVarious	Average	2003		4.5		
Heron Island	.	.	Lobster(tom.)	NorandaVarious	Geometric Mean	2003		4.0		
L1E	2550455	7656332	Lobster(tom.)	NorandaVarious	Geometric Mean	2000		8.1		
L1E	2550455	7656332	Lobster(tom.)	NorandaVarious	Geometric Mean	2001		7.9		
L1E	2550455	7656332	Lobster(tom.)	NorandaVarious	Average	2002		13		
L1E	2550455	7656332	Lobster(tom.)	NorandaVarious	Geometric Mean	2002		11		
L1E	2550455	7656332	Lobster(tom.)	NorandaVarious	Average	2003		6.5		
L1E	2550455	7656332	Lobster(tom.)	NorandaVarious	Geometric Mean	2003		5.7		
L1W	2547755	7657045	Lobster(tom.)	NorandaVarious	Geometric Mean	2000		7.0		
L1W	2547755	7657045	Lobster(tom.)	NorandaVarious	Geometric Mean	2001		7.5		

Table A4.1 Lobster Measurement Data (mg/kg wet) since 2000 (Cont'd)

Location	Easting	Northing	Media	Source	Statistic	Year	Arsenic	Cadmium	Lead	Thallium
L1W	2547755	7657045	Lobster(tom.)	NorandaVarious	Average	2002		7.0		
L1W	2547755	7657045	Lobster(tom.)	NorandaVarious	Geometric Mean	2002		6.0		
L1W	2547755	7657045	Lobster(tom.)	NorandaVarious	Average	2003		6.7		
L1W	2547755	7657045	Lobster(tom.)	NorandaVarious	Geometric Mean	2003		6.2		
L4E	2551541	7655090	Lobster(tom.)	NorandaVarious	Geometric Mean	2000		8.2		
L4E	2551541	7655090	Lobster(tom.)	NorandaVarious	Geometric Mean	2001		8.2		
L4E	2551541	7655090	Lobster(tom.)	NorandaVarious	Average	2002		15		
L4E	2551541	7655090	Lobster(tom.)	NorandaVarious	Geometric Mean	2002		12		
L4E	2551541	7655090	Lobster(tom.)	NorandaVarious	Average	2003		7.5		
L4E	2551541	7655090	Lobster(tom.)	NorandaVarious	Geometric Mean	2003		6.8		
LOBE	2549213	7657728	Lobster(tom.)	NorandaVarious	Geometric Mean	2000		8.1		
LOBE	2549213	7657728	Lobster(tom.)	NorandaVarious	Geometric Mean	2001		8.4		
LOBE	2549213	7657728	Lobster(tom.)	NorandaVarious	Average	2002		18		
LOBE	2549213	7657728	Lobster(tom.)	NorandaVarious	Geometric Mean	2002		13		
LOBE	2549213	7657728	Lobster(tom.)	NorandaVarious	Average	2003		7.2		
LOBE	2549213	7657728	Lobster(tom.)	NorandaVarious	Geometric Mean	2003		6.6		
New Habitat	2550920	7656735	Lobster(tom.)	NorandaVarious	Geometric Mean	2000		7.5		
New Habitat	2550920	7656735	Lobster(tom.)	NorandaVarious	Geometric Mean	2001		6.8		
New Habitat	2550920	7656735	Lobster(tom.)	NorandaVarious	Average	2002		19		
New Habitat	2550920	7656735	Lobster(tom.)	NorandaVarious	Geometric Mean	2002		14		
New Habitat	2550920	7656735	Lobster(tom.)	NorandaVarious	Average	2003		6.5		
New Habitat	2550920	7656735	Lobster(tom.)	NorandaVarious	Geometric Mean	2003		5.9		
Petit-Rocher	2558926	7644106	Lobster(tom.)	NorandaVarious	Geometric Mean	2000		9.1		
Petit-Rocher	2558926	7644106	Lobster(tom.)	NorandaVarious	Geometric Mean	2001		6.4		
Petit-Rocher	2558926	7644106	Lobster(tom.)	NorandaVarious	Average	2002		11		
Petit-Rocher	2558926	7644106	Lobster(tom.)	NorandaVarious	Geometric Mean	2002		9.0		
Petit-Rocher	2558926	7644106	Lobster(tom.)	NorandaVarious	Average	2003		7.1		
Petit-Rocher	2558926	7644106	Lobster(tom.)	NorandaVarious	Geometric Mean	2003		6.3		

Table A4.2 shows measurement data for mussels collected by Noranda EMP since 2000 (Brunswick Mining and Smelting Corporation, 2004f). Only large mussels were used for cadmium, lead, thallium and zinc EPCs because concentrations were generally higher in the large mussels than the small mussels and this was considered a conservative assumption. No distinction between large and small mussels was made for arsenic and mercury.

Table A4.2 Mussel Measurement Data (mg/kg wet) since 2000

Location	Easting	Northing	SubMedia	Year		Cadmium	Lead	Thallium
Chalmers	2551434	7654609	Large	2000		2.0	16	0.010
Chalmers	2551434	7654609	Large	2001		3.4	21	0.010
Chalmers	2551434	7654609	Large	2002		1.9	26	
Chalmers	2551434	7654609	Large	2003		1.8	26	
Chapel Point	2548997	7656587	Large	2000		7.7	41	0.010
Chapel Point	2548997	7656587	Large	2001		9.4	40	0.010
Chapel Point	2548997	7656587	Large	2002		8.7	52	
Chapel Point	2548997	7656587	Large	2003		11	71	
Chemin Camille	2557872	7646710	Large	2000		1.5	3.2	
Chemin Camille	2557872	7646710	Large	2001		1.5	3.0	
Chemin Camille	2557872	7646710	Large	2002		0.63	2.6	
Chemin Camille	2557872	7646710	Large	2003		0.72	3.5	
Culligan S Point	2542978	7657887	Large	2000		0.60	0.73	<0.010
Culligan S Point	2542978	7657887	Large	2001		0.80	1.2	0.010
Culligan S Point	2542978	7657887	Large	2002		0.56	1.5	
Culligan S Point	2542978	7657887	Large	2003		0.40	0.40	
Fournier	2550832	7655341	Large	2000		3.8	23	0.080
Fournier	2550832	7655341	Large	2001		5.1	32	0.060
Fournier	2550832	7655341	Large	2002		2.8	38	
Fournier	2550832	7655341	Large	2003		2.8	45	
Marche Arsenault	2559059	7639595	Large	2000		0.90	1.5	
Marche Arsenault	2559059	7639595	Large	2001		1.0	1.2	
Marche Arsenault	2559059	7639595	Large	2002		0.40	2.3	
Marche Arsenault	2559059	7639595	Large	2003		0.55	1.7	
Maritime Motel	2558540	7643824	Large	2000		0.90	2.4	
Maritime Motel	2558540	7643824	Large	2001		0.90	2.0	
Maritime Motel	2558540	7643824	Large	2002		0.67	2.8	
Maritime Motel	2558540	7643824	Large	2003		0.58	2.2	
Park Road	2556012	7649850	Large	2000		1.5	7.1	
Park Road	2556012	7649850	Large	2001		1.3	6.3	
Park Road	2556012	7649850	Large	2002		0.81	5.7	
Park Road	2556012	7649850	Large	2003		0.93	11	
Razor Cove	2528839	7661689	Large	2000		0.90	0.67	0.010
Razor Cove	2528839	7661689	Large	2001		0.60	0.60	0.010
Razor Cove	2528839	7661689	Large	2002		0.31	0.80	
Razor Cove	2528839	7661689	Large	2003		0.48	0.40	
Rue Thomas	2559450	7636724	Large	2000		0.90	0.87	
Rue Thomas	2559450	7636724	Large	2001		1.1	0.93	
Rue Thomas	2559450	7636724	Large	2002		0.47	0.95	
Rue Thomas	2559450	7636724	Large	2003		0.99	2.0	
Rue De L Anse	2553992	7652550	Large	2000		1.5	7.1	
Rue De L Anse	2553992	7652550	Large	2001		1.6	7.3	
Rue De L Anse	2553992	7652550	Large	2002		0.96	8.0	
Rue De L Anse	2553992	7652550	Large	2003		0.80	9.4	
Rue Du Bateau	2556212	7649650	Large	2000		1.6	5.3	
Rue Du Bateau	2556212	7649650	Large	2001		0.80	5.8	
Rue Du Bateau	2556212	7649650	Large	2002		0.53	3.4	
Rue Du Bateau	2556212	7649650	Large	2003		0.98	8.4	
Shell Plant	2547235	7656981	Large	2000		1.1	2.4	<0.010
Shell Plant	2547235	7656981	Large	2001		1.1	2.7	<0.010
Shell Plant	2547235	7656981	Large	2002		0.57	2.4	
Shell Plant	2547235	7656981	Large	2003		0.66	1.5	

Table A4.2 Mussel Measurement Data (mg/kg wet) since 2000 (Cont'd)

Location	Easting	Northing	SubMedia	Year		Cadmium	Lead	Thallium
Smearer S	2552459	7653886	Large	2000		1.9	11	
Smearer S	2552459	7653886	Large	2001		1.9	11	0.010
Smearer S	2552459	7653886	Large	2002		1.2	13	
Smearer S	2552459	7653886	Large	2003		1.6	22	
Chalmers	2551434	7654609	Small	2000		1.6	16	0.040
Chalmers	2551434	7654609	Small	2001		1.6	12	0.010
Chalmers	2551434	7654609	Small	2002		1.3	21	
Chalmers	2551434	7654609	Small	2003		1.7	34	
Chapel Point	2548997	7656587	Small	2000		7.3	29	0.010
Chapel Point	2548997	7656587	Small	2001		6.7	28	0.030
Chapel Point	2548997	7656587	Small	2002		5.9	43	
Chapel Point	2548997	7656587	Small	2003		5.5	41	
Chemin Camille	2557872	7646710	Small	2000		0.60	1.6	
Chemin Camille	2557872	7646710	Small	2001		0.50	1.6	
Chemin Camille	2557872	7646710	Small	2002		0.25	3.5	
Chemin Camille	2557872	7646710	Small	2003		0.39	2.6	
Culligan S Point	2542978	7657887	Small	2000		0.30	0.60	<0.010
Culligan S Point	2542978	7657887	Small	2001		0.20	0.96	0.010
Culligan S Point	2542978	7657887	Small	2002		0.17	0.76	
Culligan S Point	2542978	7657887	Small	2003		0.25	0.60	
Fournier	2550832	7655341	Small	2000		2.9	19	0.11
Fournier	2550832	7655341	Small	2001		2.4	19	0.060
Fournier	2550832	7655341	Small	2002		1.9	38	
Fournier	2550832	7655341	Small	2003		2.4	47	
Marche Arsenault	2559059	7639595	Small	2000		0.30	1.0	
Marche Arsenault	2559059	7639595	Small	2001		0.50	1.8	
Marche Arsenault	2559059	7639595	Small	2002		0.23	1.2	
Marche Arsenault	2559059	7639595	Small	2003		0.42	1.6	
Maritime Motel	2558540	7643824	Small	2000		0.30	1.2	
Maritime Motel	2558540	7643824	Small	2001		0.40	1.4	
Maritime Motel	2558540	7643824	Small	2002		0.24	2.3	
Maritime Motel	2558540	7643824	Small	2003		1.8	13	
Park Road	2556012	7649850	Small	2000		0.80	6.4	
Park Road	2556012	7649850	Small	2001		0.30	3.1	
Park Road	2556012	7649850	Small	2002		0.34	5.2	
Park Road	2556012	7649850	Small	2003		0.46	7.0	
Razor Cove	2528839	7661689	Small	2000		0.60	0.53	0.010
Razor Cove	2528839	7661689	Small	2001		0.30	0.40	0.010
Razor Cove	2528839	7661689	Small	2002		0.20	1.5	
Razor Cove	2528839	7661689	Small	2003		0.34	0.37	
Rue Thomas	2559450	7636724	Small	2000		0.50	0.80	
Rue Thomas	2559450	7636724	Small	2001		0.30	0.53	
Rue Thomas	2559450	7636724	Small	2002		0.22	1.3	
Rue Thomas	2559450	7636724	Small	2003		0.41	1.1	
Rue De L Anse	2553992	7652550	Small	2000		0.80	5.4	
Rue De L Anse	2553992	7652550	Small	2001		0.60	4.9	
Rue De L Anse	2553992	7652550	Small	2002		0.49	9.6	
Rue De L Anse	2553992	7652550	Small	2003		0.64	11	
Rue Du Bateau	2556212	7649650	Small	2000		0.60	3.0	
Rue Du Bateau	2556212	7649650	Small	2001		0.60	3.1	
Rue Du Bateau	2556212	7649650	Small	2002		0.33	3.6	
Rue Du Bateau	2556212	7649650	Small	2003		0.51	6.8	

Table A4.2 Mussel Measurement Data (mg/kg wet) since 2000 (Cont'd)

Location	Easting	Northing	SubMedia	Year		Cadmium	Lead	Thallium
Shell Plant	2547235	7656981	Small	2000		0.50	2.0	<0.010
Shell Plant	2547235	7656981	Small	2001		0.30	2.2	<0.010
Shell Plant	2547235	7656981	Small	2002		0.37	2.5	
Shell Plant	2547235	7656981	Small	2003		1.4	1.7	
Smearer S	2552459	7653886	Small	2000		1.0	7.8	0.020
Smearer S	2552459	7653886	Small	2001		1.1	7.7	<0.010
Smearer S	2552459	7653886	Small	2002		0.75	9.7	
Smearer S	2552459	7653886	Small	2003		0.83	13	

Tables A4.3 and A4.4 show summaries of the data for lobster and wild mussels, respectively.

Data sources for lobster concentrations included Brunswick Mining and Smelting Corporation (2004e), Chou and Uthe (1993), Deveau (1994), Levaque Charron (1981), MacLaren Marex (1978), Prairie (1981), Uthe and Chou (1985; 1986), Uthe *et al.* (1982; 1983), and Wood (1983).

Data sources for mussel concentrations included Brunswick Mining and Smelting Corporation (2004f), Government of Canada (1984), Levaque Charron (1981), MacLaren Marex (1978) and Wood (1983).

Table A4.3 Summary of Lobster Data Considered in the Assessment (mg/kg wet)

Lobster	Location	Time Period	Total Number of Reported Values in Data Set	# Reported Values Below the Detection Limit	Mean (unless otherwise noted)	Standard Deviation	95th%UCL
Arsenic	Upper Belledune	1975-84	1	0	0.09	*b*	0.10
	Upper Belledune	1985-99	13	0	0.09	0.02	0.10
	Lower Belledune	1985-99	31	0	0.10	0.02	0.1
	Pointe-Verte	1985-99	14	0	0.10	0.02	0.11
	Petit-Rocher	1985-99	10	0	0.11	0.02	0.13
	Upper Belledune	2000-03	3	0	0.06	0.03	0.14
	Lower Belledune	2000-03	9	0	0.07	0.04	0.09
	Pointe-Verte	2000-03	3	0	0.06	0.03	0.14
	Petit-Rocher	2000-03	3	0	0.06	0.04	0.15
	Baseline	1975-84	4	2	0.06	0.06	*a*
	Baseline	1985-99	14	0	0.09	0.02	*a*
	Baseline	2000-03	3	0	0.05	0.04	*a*
	Baseline Total - median	1975-2003	21	2	0.08	0.03	*a*

Table A4.3 Summary of Lobster Data Considered in the Assessment (mg/kg wet) (Cont'd)

Lobster	Location	Time Period	Total Number of Reported Values in Data Set	# Reported Values Below the Detection Limit	Mean (unless otherwise noted)	Standard Deviation	95th%UCL
Cadmium	Upper Belledune	1967-74	3	0	0.19	0.12	0.47
	Pointe-Verte	1967-74	2	0	0.12	0.11	1.07
	Upper Belledune	1975-84	4	0	0.07	0.04	0.13
	Lower Belledune	1975-84	7	0	0.19	0.05	0.24
	Pointe-Verte	1975-84	4	0	0.13	0.05	0.21
	Petit-Rocher	1975-84	4	0	0.06	0.03	0.12
	Upper Belledune	1985-99	14	0	0.03	0.01	0.04
	Lower Belledune	1985-99	33	0	0.05	0.01	0.05
	Pointe-Verte	1985-99	15	0	0.04	0.01	0.05
	Petit-Rocher	1985-99	13	0	0.04	0.01	0.04
	Upper Belledune	2000-03	4	0	0.02	0.00	0.03
	Lower Belledune	2000-03	12	0	0.02	0.00	0.03
	Pointe-Verte	2000-03	4	0	0.02	0.01	0.03
	Petit-Rocher	2000-03	4	0	0.02	0.01	0.04
	Baseline	1967-74	1	0	0.30	*b*	*a*
	Baseline	1975-84	12	2	0.12	0.24	*a*
	Baseline	1985-99	15	0	0.02	0.01	*a*
	Baseline	2000-03	4	0	0.02	0.00	*a*
	Baseline Total - median	1967-2003	32	2	0.02	0.16	*a*
Lead	Upper Belledune	1967-74	3	1	3.40	4.70	15.10
	Pointe-Verte	1967-74	2	1	0.25	0.07	0.89
	Lower Belledune	1975-84	1	0	1.31	*b*	2.62
	Upper Belledune	1985-99	4	0	0.33	0.29	0.80
	Lower Belledune	1985-99	17	0	0.39	0.20	0.50
	Pointe-Verte	1985-99	4	0	0.33	0.21	0.60
	Petit-Rocher	1985-99	4	0	0.15	0.07	0.27
	Upper Belledune	2000-03	4	0	0.18	0.12	0.37
	Lower Belledune	2000-03	12	0	0.32	0.14	0.41
	Pointe-Verte	2000-03	4	0	0.20	0.08	0.32
	Petit-Rocher	2000-03	4	0	0.19	0.11	0.35
	Baseline	1967-74	1	0	8.90	*b*	*a*
	Baseline	1975-84	9	2	1.58	2.07	*a*
	Baseline	1985-99	5	0	0.12	0.08	*a*
	Baseline	2000-03	4	0	0.14	0.06	*a*
	Baseline Total - median	1967-2003	19	2	0.17[c]	*d*	*a*
Mercury	Upper Belledune	1967-74	2	0	0.09	0.08	*
	Pointe-Verte	1967-74	1	0	0.10	*b*	*
	Upper Belledune	1985-99	13	0	0.18	0.03	*
	Lower Belledune	1985-99	31	0	0.21	0.08	*
	Pointe-Verte	1985-99	14	0	0.17	0.03	*

Table A4.3 Summary of Lobster Data Considered in the Assessment (mg/kg wet) (Cont'd)

Lobster	Location	Time Period	Total Number of Reported Values in Data Set	# Reported Values Below the Detection Limit	Mean (unless otherwise noted)	Standard Deviation	95th%UCL
	Petit-Rocher	1985-99	10	0	0.14	0.03	*
	Upper Belledune	2000-03	4	0	0.13	0.01	0.14
	Lower Belledune	2000-03	12	0	0.14	0.04	0.16
	Pointe-Verte	2000-03	4	0	0.12	0.03	0.17
	Petit-Rocher	2000-03	4	0	0.10	0.01	0.11
	Baseline	1975-84	3	0	0.07	0.03	a
	Baseline	1985-99	14	0	0.14	0.03	a
	Baseline	2000-03	4	0	0.11	0.03	a
	Baseline Total - median	1975-2003	21	0	0.12	0.04	a
Thallium	Upper Belledune	1985-99	1	0	0.07	b	*
	Lower Belledune	1985-99	3	0	0.05	0.02	*
	Pointe-Verte	1985-99	1	0	0.06	b	*
	Upper Belledune	2000-03	1	0	0.01	b	0.01
	Lower Belledune	2000-03	1	0	0.01	b	0.01
	Pointe-Verte	2000-03	1	0	0.01	b	0.01
	Petit-Rocher	2000-03	1	0	0.01	b	0.01
	Baseline	2000-03	1	0	0.01	b	a
	Baseline Total - median	2000-03	1	0	0.01	b	a
Zinc	Upper Belledune	1967-74	3	0	25.33	4.75	*
	Pointe-Verte	1967-74	2	0	23.45	1.06	*
	Upper Belledune	2000-03	1	0	22.80	b	45.60
	Lower Belledune	2000-03	3	0	22.74	0.78	24.68
	Pointe-Verte	2000-03	1	0	24.97	b	49.94
	Petit-Rocher	2000-03	1	0	25.76	b	51.52
	Baseline	1967-74	1	0	30.90	b	a
	Baseline	1975-84	6	0	24.17	8.04	a
	Baseline	2000-03	1	0	24.18	b	a
	Baseline Total - median	1967-2003	8	0	23.49	7.20	a

Notes: * Upper confidence limits were not calculated because they were not part of the risk assessment.

a - upper confidence limits were not calculated for baseline

b - standard deviation could not be calculated when sample size equal to one

c - baseline for lead was calculated by deleting all values greater than one due to the large standard deviation

d - standard deviation not available

Table A4.4 Summary of Mussel Data Considered in the Assessment (mg/kg wet)

Mussels	Location	Time Period	Total Number of Reported Values in Data Set	# Reported Values Below the Detection Limit	Mean (unless otherwise noted)	Standard Deviation	95th%UCL
Arsenic [1]	Upper Belledune	1975-84	4	0	0.05	0.02	0.07
	Lower Belledune	1975-84	4	0	0.05	0.01	0.07
	Pointe-Verte	1975-84	3	0	0.05	0.00	0.06
	Petit-Rocher	1975-84	2	0	0.05	0.01	0.10
	Lower Belledune	2000-03	1	0	0.06	*	0.13
	Baseline Total - median	1975-84	4	0	0.04	0.02	*a*
Cadmium [2]	Townsite #2	1975-84	24	0	1.23	*c*	3.15
	Lower Belledune	1975-84	22	0	10.95	*c*	18.04
	Pointe-Verte	1975-84	23	0	5.61	*c*	0.13
	Petit-Rocher	1975-84	11	0	2.71	*c*	0.21
	Townsite #2	1985-99	54	0	1.07	*c*	2.26
	Lower Belledune	1985-99	48	0	3.28	*c*	5.81
	Pointe-Verte	1985-99	72	0	1.26	*c*	1.75
	Petit-Rocher	1985-99	30	0	0.97	*c*	1.51
	Townsite #2	2000-03	16	0	0.81	*c*	1.31
	Lower Belledune	2000-03	17	0	2.13	*c*	3.30
	Pointe-Verte	2000-03	24	0	1.01	*c*	1.23
	Petit-Rocher	2000-03	16	0	0.79	*c*	1.03
	Baseline	1975-84	13	0	0.97	*c*	*a*
	Baseline	1985-99	21	0	1.93	*c*	*a*
	Baseline	2000-03	8	0	0.47	*c*	*a*
	Baseline Total - median	1975-2003	42	0	0.50	*c*	*a*
Lead [2]	Pointe-Verte	1967-74	1	0	16.69	*	24.92
	Townsite #2	1975-84	14	0	1.23	*c*	10.25
	Lower Belledune	1975-84	21	0	36.70	*c*	53.11
	Pointe-Verte	1975-84	17	0	16.69	*c*	24.92
	Petit-Rocher	1975-84	6	0	3.61	*c*	10.96
	Townsite #2	1985-99	54	0	1.84	*c*	4.66
	Lower Belledune	1985-99	72	0	22.59	*c*	33.76
	Pointe-Verte	1985-99	72	0	7.91	*c*	10.55
	Petit-Rocher	1985-99	26	0	2.16	*c*	4.80
	Townsite #2	2000-03	16	0	1.26	*c*	3.58
	Lower Belledune	2000-03	25	0	20.26	*c*	28.71
	Pointe-Verte	2000-03	24	0	8.02	*c*	10.32
	Petit-Rocher	2000-03	16	0	1.87	*c*	3.91
	Baseline	1975-84	13	1	2.24	*c*	*a*
	Baseline	1985-99	19	0	1.00	*c*	*a*

Table A4.4 Summary of Mussel Data Considered in the Assessment (mg/kg wet) (Cont'd)

Mussels	Location	Time Period	Total Number of Reported Values in Data Set	# Reported Values Below the Detection Limit	Mean (unless otherwise noted)	Standard Deviation	95th%U CL
	Baseline	2000-03	8	0	0.66	*c*	*a*
	Baseline Total - median	1975-2003	40	1	0.50	*c*	*a*
Mercury [1]	Upper Belledune	1975-84	6	1	0.05	0.03	0.08
	Lower Belledune	1975-84	7	2	0.05	0.04	0.08
	Pointe-Verte	1975-84	4	0	0.05	0.04	0.10
	Petit-Rocher	1975-84	3	0	0.04	0.03	0.13
	Baseline	1975-84	6	0	0.16	0.23	*a*
	Baseline Total - median	1975-84	6	0	0.05	0.23	*a*
Thallium [2]	Townsite #2	2000-03	8	0	0.01	*c*	0.03
	Lower Belledune	2000-03	11	0	0.02	*c*	0.04
	Pointe-Verte	2000-03	*b*	*b*	0.02	*c*	0.04
	Petit-Rocher	2000-03	*b*	*b*	0.02	*c*	0.05
	Baseline	2000-03	4	0	0.01	*c*	*a*
	Baseline Total - median	2000-03	4	0	0.01	*c*	*a*
Zinc [2]	Townsite #2	2000-03	16	0	14.09	*c*	19.35
	Lower Belledune	2000-03	24	0	27.38	*c*	33.22
	Pointe-Verte	2000-03	24	0	19.48	*c*	21.90
	Petit-Rocher	2000-03	16	0	14.43	*c*	16.52
	Baseline	2000-03	8	0	16.81	*c*	*a*
	Baseline Total - median	2000-03	8	0	13.70	*c*	*a*

Notes:
* - standard deviation could not be calculated when the sample size was equal to one.
a - upper confidence limits were not calculated for baseline
b - thallium concentrations in these study areas were entirely based on empirical modelling
c - standard deviation not available
1 - All arsenic and mercury concentrations were based on measured concentrations, and included both large and small mussels. Boundaries for Upper Belledune stretched from Nash Creek to 1W.
2 - All other concentrations were based on empirical relationship between concentration and distance for the shorelines of the respective study areas. Samples included only large mussels.

Data sources for fish concentrations included the Department of Fisheries and Oceans (1980), Levaque Charron (1981), and MacLaren Marex (1978).

Fish samples included many different species of fish, but all fish considered for this study were edible. Fish species were given using common names, and included:

- Atlantic mackerel;
- Sculpin (shorthorn and longhorn);
- Cunner;

- Sandlance (American);
- Silverside;
- Wrymouth;
- Flounder (Windowpane, Winter and Yellowtail);
- Greenland cod;
- Tomcod;
- Pollock/Pollack;
- Hake;
- Smelt;
- Capelin;
- Winter skate;
- American plaice;
- American smelt;
- White hake.

Data about the portion of the fish sampled were not always provided. Typically, the portion sampled included only fish flesh or muscle, while a number of samples listed the whole fish as being analyzed, or did not specify the portion analyzed. It is recognized that fish muscle samples are typically used to assess exposure to contaminants because people do not tend to consume internal fish organs or skin; however, the limited number of fish samples necessitated the use of all samples.

Table A4.5 provides a summary of the fish data considered for the HHRA. There were too many data points to be provided in the Appendix; however they are available if necessary.

Table A4.5 Summary of Fish Data Considered in the Assessment (mg/kg wet)

Fish	Location	Time Period	Total Number of Reported Values in Data Set	# Reported Values Below the Detection Limit	Mean	Standard Deviation	95th%UCL
Arsenic	Baie des Chaleurs	1967-74	1	0	0.01	*b*	0.02
	Baie des Chaleurs	1975-84	24	17	0.01	0.01	0.02
	Baie des Chaleurs	1985-99	25	17	0.01	0.01	0.02
	Baie des Chaleurs	2000-03	25	17	0.01	0.01	0.02
	Baseline	1975-84	31	25	0.01	0.01	*a*
Cadmium	Baie des Chaleurs	1967-74	46	16	0.04	0.03	0.05
	Baie des Chaleurs	1975-84	83	40	0.08	0.08	0.10
	Baie des Chaleurs	1985-99	129	56	0.07	0.07	0.08
	Baie des Chaleurs	2000-03	129	56	0.07	0.07	0.08
	Baseline	1975-84	49	33	0.06	0.03	*a*
Lead	Baie des Chaleurs	1967-74	46	6	1.51	1.47	1.95
	Baie des Chaleurs	1975-84	73	13	3.68	4.78	4.80
	Baie des Chaleurs	1985-99	119	19	2.84	3.98	3.57
	Baie des Chaleurs	2000-03	119	19	2.84	3.98	3.57
	Baseline	1975-84	49	26	1.05	1.72	*a*
Mercury	Baie des Chaleurs	1967-74	24	0	0.08	0.09	*
	Baie des Chaleurs	1975-84	44	0	0.08	0.15	*
	Baie des Chaleurs	1985-99	68	0	0.08	0.13	*
	Baie des Chaleurs	2000-03	68	0	0.08	0.13	0.11
	Baseline	1975-84	33	0	0.09	0.17	*a*
Thallium	Baie des Chaleurs	-	-	-	-	-	-
	Baseline	-	-	-	-	-	-
Zinc	Baie des Chaleurs	1967-74	46	0	17.51	9.45	*
	Baie des Chaleurs	1975-84	69	0	15.27	10.53	*
	Baie des Chaleurs	1985-99	115	0	16.17	10.13	*
	Baie des Chaleurs	2000-03	115	0	16.17	10.13	18.03
	Baseline	1975-84	49	0	12.32	4.78	*a*

Notes: * Upper confidence limits were not calculated because they were not part of the risk assessment.

a - upper confidence limits were not calculated for baseline

b - standard deviation could not be calculated when sample size equal to one

- no thallium fish concentrations were available

A4.1 Data Interpretation

Wet Weight/Dry Weight

Many reports specified whether seafood concentrations were presented in wet weight or dry weight, and most samples were reported in wet weight. A few reports did not specify whether values were wet weight or dry weight, and in these cases, wet weights were assumed. This was a conservative assumption, because had concentrations instead been given in dry weight, a conversion to wet weight would have been needed, which would have decreased the concentration.

Arithmetic or Geometric Mean

Seafood data for a given year were often presented as means of different samples. Frequently, reports specified whether means were arithmetic or geometric, but sometimes this information was not given. In either case, arithmetic or geometric means were accorded equal weight in the calculation of mean and upper bound fish, lobster or mussel contaminant concentrations for a given year. Furthermore, seafood samples often provided information regarding the sample size, but this information was not used to weight the values in any way.

Inconsistencies in Noranda Data

The New Brunswick Mining and Smelting Corporation (Noranda) was the biggest source of lobster data. Two major inconsistencies were noted in the Noranda data and assumptions were made to work around them. The first inconsistency regarded lobster arsenic concentrations in 1993, which were reported differently in different annual Noranda reports. The 1993 lobster arsenic values noted in the 1993 Noranda report contained concentrations that were half the 1993 values reported in the Noranda reports of subsequent years, which summarized historical data. Because this inconsistency appeared exclusively (to our knowledge) in the 1993 report, the 1993 values from the subsequent annual reports were used.

The second inconsistency regarded all lobster contaminant concentrations reported in the Noranda 2003 report. Concentrations for arsenic, cadmium and lead were presented in Appendix A. These concentrations were exactly double the same contaminant concentrations presented in Appendix D, where the raw data were summarized. Because Appendix D listed all samples and all contaminants measured, data from here were selected to estimate 2003 lobster concentrations. The only exception to this was for mercury, where concentrations were estimated from a table presented in the report, as this was the only place these data were presented.

A4.2 Relationship between Measured Mussel Concentrations and Distance

Table 4.6 shows the measurement data used to develop the relationship. The data are from the Noranda EMP for large wild mussels and the distances were calculated based on geographic coordinates of the monitoring data. As seen from the table, relationships were only developed for cadmium, lead, thallium and zinc.

Table A4.6 Summary of Mussel Data used to Derive Relationship with Distance from Smelter

Location	Distance	Year	Cadmium	Lead	Thallium	Zinc
Current Time Period						
0	0.0	2000	7.7	41.3	0.01	36.8
0	0.0	2001	9.4	39.5	0.01	33.4
0	0.0	2002	8.65	52	.	46
0	0.0	2003	11	70.5	.	52.8
1E	2.2	2000	3.8	22.8	0.08	37.3
1E	2.2	2001	5.1	31.5	0.06	53.6
1E	2.2	2002	2.75	37.5	.	41.4
1E	2.2	2003	2.75	44.7	.	35
2E	3.1	2000	2	15.8	0.01	33.6
2E	3.1	2001	3.4	21.4	0.01	30.8
2E	3.1	2002	1.94	25.8	.	27.9
2E	3.1	2003	1.82	26.1	.	18.3
2W	1.8	2000	1.1	2.43	0.005	19.5
2W	1.8	2001	1.1	2.73	0.005	15.7
2W	1.8	2002	0.57	2.36	.	13.2
2W	1.8	2003	0.66	1.5	.	11.03
3E	4.3	2000	1.9	10.5	.	21.9
3E	4.3	2001	1.9	11.2	0.01	21.9
3E	4.3	2002	1.21	13.3	.	20.6
3E	4.3	2003	1.58	22	.	22.43
4E	6.4	2000	1.5	7.1	.	28.5
4E	6.4	2001	1.6	7.3	.	19.4
4E	6.4	2002	0.96	8	.	14.6
4E	6.4	2003	0.8	9.4	.	13.8
4W	6.4	2000	0.6	0.73	0.005	15.8
4W	6.4	2001	0.8	1.2	0.01	14.4
4W	6.4	2002	0.56	1.5	.	13.6

Table A4.6 Summary of Mussel Data used to Derive Relationship with Distance from Smelter

Location	Distance	Year	Cadmium	Lead	Thallium	Zinc
4W	6.4	2003	0.4	0.4	.	10.6
5.1E	9.9	2000	1.6	5.3	.	18.1
5.1E	9.9	2001	0.8	5.8	.	14.9
5.1E	9.9	2002	0.53	3.4	.	13.7
5.1E	9.9	2003	0.98	8.4	.	16.3
6E	13.8	2000	1.5	3.2	.	17.8
6E	13.8	2001	1.5	3.03	.	17.5
6E	13.8	2002	0.63	2.6	.	14.6
6E	13.8	2003	0.72	3.5	.	10.6
7E	16.1	2000	0.9	2.4	.	15
7E	16.1	2001	0.9	2	.	14.8
7E	16.1	2002	0.67	2.8	.	19.2
7E	16.1	2003	0.58	2.2	.	9.1
8E	19.9	2000	0.9	1.5	.	14.9
8E	19.9	2001	1	1.23	.	16.2
8E	19.9	2002	0.4	2.3	.	11.7
8E	19.9	2003	0.55	1.7	.	9.3
9E	22.5	2000	0.9	0.87	.	15.5
9E	22.5	2001	1.1	0.93	.	18.2
9E	22.5	2002	0.47	0.95	.	12.3
9E	22.5	2003	0.99	2	.	14.8
REF.4	20.8	2000	0.9	0.67	0.01	19.3
REF.4	20.8	2001	0.6	0.6	0.01	15.4
REF.4	20.8	2002	0.31	0.8	.	15.7
REF.4	20.8	2003	0.48	0.4	.	11.33
1985-1999 Time Period						
0	0.0	1984	26.7	81.8	.	.
0	0.0	1988	34.9	102.98	.	.
0	0.0	1989	18.6	32	.	.
0	0.0	1998	9.3	70.8	.	.
0	0.0	1999	20.2	57.4	.	.
1E	2.2	1984	11.8	106.3	.	.
1E	2.2	1988	11.2	101.6	.	.
1E	2.2	1989	4.5	34.9	.	.
1E	2.2	1990	2.2	25.2	.	.
1E	2.2	1991	2.6	29.6	.	.
1E	2.2	1992	4.1	20.6	.	.
1E	2.2	1993	4.8	18.9	.	.
1E	2.2	1994	8.1	29	.	.
1E	2.2	1995	9.1	26	.	.
1E	2.2	1996	4.3	19	.	.
1E	2.2	1997	5.9	25.2	.	.
1E	2.2	1998	5.3	24.7	.	.
1E	2.2	1999	8.8	44.2	.	.
2E	3.1	1988	6.3	61.8	.	.
2E	3.1	1989	3.8	23.6	.	.
2E	3.1	1990	2.2	15.6	.	.
2E	3.1	1991	1.8	15.4	.	.
2E	3.1	1992	2.2	13.5	.	.

Table A4.6 Summary of Mussel Data used to Derive Relationship with Distance from Smelter

Location	Distance	Year	Cadmium	Lead	Thallium	Zinc
2E	3.1	1993	2.6	12.9	.	.
2E	3.1	1994	3.3	17.1	.	.
2E	3.1	1995	4.8	23.7	.	.
2E	3.1	1996	2.9	12.1	.	.
2E	3.1	1997	2.7	23.3	.	.
2E	3.1	1998	3.1	16.5	.	.
2E	3.1	1999	2.4	16.5	.	.
2W	1.8	1984	1.5	4.9	.	.
2W	1.8	1988	1.7	3.4	.	.
2W	1.8	1989	1.4	3.1	.	.
2W	1.8	1990	1.1	4.3	.	.
2W	1.8	1991	0.6	1.5	.	.
2W	1.8	1992	0.5	1.2	.	.
2W	1.8	1993	1	1.9	.	.
2W	1.8	1994	1.4	1.8	.	.
2W	1.8	1995	2.2	3.2	.	.
2W	1.8	1996	1	3.2	.	.
2W	1.8	1997	1.7	2.2	.	.
2W	1.8	1998	1.2	1.8	.	.
2W	1.8	1999	1.3	2.5	.	.
3E	4.3	1984	5.8	36.6	.	.
3E	4.3	1988	5.5	54.97	.	.
3E	4.3	1989	2.8	18.3	.	.
3E	4.3	1990	2.2	18.4	.	.
3E	4.3	1991	1.3	8.6	.	.
3E	4.3	1992	1	5.6	.	.
3E	4.3	1993	1.8	10.8	.	.
3E	4.3	1994	3.5	13.5	.	.
3E	4.3	1995	3.5	10.4	.	.
3E	4.3	1996	3.3	12.6	.	.
3E	4.3	1997	2.2	11.2	.	.
3E	4.3	1998	2.7	13.8	.	.
3E	4.3	1999	2.6	11.8	.	.
4E	6.4	1984	4.4	23.7	.	.
4E	6.4	1988	3.8	32.07	.	.
4E	6.4	1989	2.2	14	.	.
4E	6.4	1990	1.1	8.2	.	.
4E	6.4	1991	0.9	6.6	.	.
4E	6.4	1992	0.7	4.9	.	.
4E	6.4	1993	1	4.2	.	.
4E	6.4	1994	2.1	9.7	.	.
4E	6.4	1995	2.1	6	.	.
4E	6.4	1996	1.2	5.7	.	.
4E	6.4	1997	1.4	7.9	.	.
4E	6.4	1998	1.5	6.5	.	.
4E	6.4	1999	2.1	8.7	.	.
4W	6.4	1988	1.3	2.07	.	.
4W	6.4	1989	0.7	0.9	.	.
4W	6.4	1990	0.3	1.7	.	.

Table A4.6 Summary of Mussel Data used to Derive Relationship with Distance from Smelter

Location	Distance	Year	Cadmium	Lead	Thallium	Zinc
4W	6.4	1991	0.3	0.4	.	.
4W	6.4	1992	0.3	0.4	.	.
4W	6.4	1993	0.5	0.4	.	.
4W	6.4	1994	0.9	0.9	.	.
4W	6.4	1995	0.6	0.3	.	.
4W	6.4	1996	0.6	0.6	.	.
4W	6.4	1997	0.4	1	.	.
4W	6.4	1998	0.9	0.5	.	.
4W	6.4	1999	0.7	1.1	.	.
5.1E	9.9	1984	2.1	12.7	.	.
5.1E	9.9	1988	2.7	17.53	.	.
5.1E	9.9	1989	2	17.3	.	.
5.1E	9.9	1990	1.2	6.5	.	.
5.1E	9.9	1991	0.8	5.8	.	.
5.1E	9.9	1992	0.4	3.3	.	.
5.1E	9.9	1993	0.7	3.8	.	.
5.1E	9.9	1994	1	4.2	.	.
5.1E	9.9	1995	1.9	5.2	.	.
5.1E	9.9	1996	1.4	4.6	.	.
5.1E	9.9	1997	2	6.1	.	.
5.1E	9.9	1998	1.4	4.5	.	.
5.1E	9.9	1999	1.6	5.1	.	.
6E	13.8	1988	2.1	.	.	.
6E	13.8	1989	1.1	3.5	.	.
6E	13.8	1999	1.5	3.6	.	.
7E	16.1	1984	1.4	3.7	.	.
7E	16.1	1988	1	.	.	.
7E	16.1	1989	0.9	1.8	.	.
7E	16.1	1990	0.9	1.4	.	.
7E	16.1	1991	0.4	1.1	.	.
7E	16.1	1992	0.4	1.4	.	.
7E	16.1	1993	0.6	1.6	.	.
7E	16.1	1994	1.4	3.2	.	.
7E	16.1	1995	1.4	2.9	.	.
7E	16.1	1996	0.9	2.1	.	.
7E	16.1	1997	1	2.2	.	.
7E	16.1	1998	0.8	1.9	.	.
7E	16.1	1999	1.2	2.5	.	.
8E	19.9	1988	1.2	.	.	.
8E	19.9	1989	0.9	.	.	.
8E	19.9	1990	0.6	1.3	.	.
8E	19.9	1991	0.3	0.8	.	.
8E	19.9	1992	0.2	1	.	.
8E	19.9	1993	0.5	0.8	.	.
8E	19.9	1994	1	2.2	.	.
8E	19.9	1995	1.3	2	.	.
8E	19.9	1996	0.6	1.3	.	.
8E	19.9	1997	0.6	1.5	.	.
8E	19.9	1998	1.2	1.6	.	.

Table A4.6 Summary of Mussel Data used to Derive Relationship with Distance from Smelter

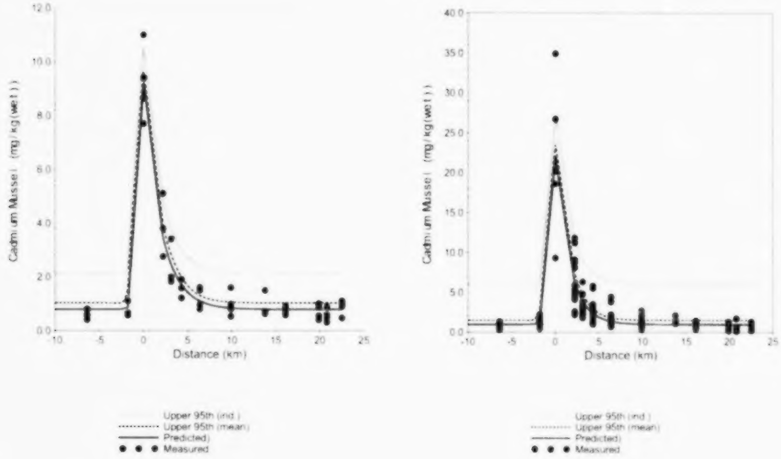
Location	Distance	Year	Cadmium	Lead	Thallium	Zinc
8E	19.9	1999	0.9	1.8	.	.
9E	22.5	1984	0.8	2.4	.	.
9E	22.5	1988	1.1	.	.	.
9E	22.5	1989	0.6	1.2	.	.
9E	22.5	1990	0.4	0.4	.	.
9E	22.5	1991	0.3	0.6	.	.
9E	22.5	1992	0.2	0.5	.	.
9E	22.5	1993	0.4	0.8	.	.
9E	22.5	1994	1.2	2.3	.	.
9E	22.5	1995	1.1	1.4	.	.
9E	22.5	1996	0.7	1.2	.	.
9E	22.5	1997	0.7	1.3	.	.
9E	22.5	1998	1.3	1.4	.	.
9E	22.5	1999	0.8	0.9	.	.
REF.4	20.8	1984	0.5	0.7	.	.
REF.4	20.8	1988	0.6	.	.	.
REF.4	20.8	1989	0.4	0.4	.	.
REF.4	20.8	1990	0.5	2.2	.	.
REF.4	20.8	1991	0.3	0.2	.	.
REF.4	20.8	1992	0.1	0.3	.	.
REF.4	20.8	1994	0.7	0.4	.	.
REF.4	20.8	1995	0.4	0.4	.	.
REF.4	20.8	1996	1.7	2.6	.	.
REF.4	20.8	1997	0.6	0.8	.	.
REF.4	20.8	1998	0.295	0.4	.	.
REF.4	20.8	1999	0.5	0.4	.	.
1975-1984						
0	0.0	1981	40.5	68.7	.	.
0	0.0	1982	.	81.5	.	.
0	0.0	1983	.	82.2	.	.
2W	1.8	1983	1.7	3.9	.	.
3E	4.3	1981	12	38.7	.	.
3E	4.3	1982	5.5	18	.	.
3E	4.3	1983	8.2	39.7	.	.
8E	19.9	1982	1.2	1.3	.	.
8E	19.9	1983	1	1.6	.	.
9E	22.5	1981	1.9	.	.	.
REF.4	20.8	1982	0.4	0.5	.	.

The following graphs show the relationship between concentrations in wild mussels and distance. Cadmium, lead and zinc show similar patterns of decreasing concentration with distance with a more rapid decrease to the west compared to the east. The thallium relationship is less pronounced due in part to many of the thallium concentrations being reported as "<" values (i.e., below the reporting limit).

Figure A26 Cadmium Relationship in Mussels with Distance

a) Current

b) 1985-1999



c) 1975-1984

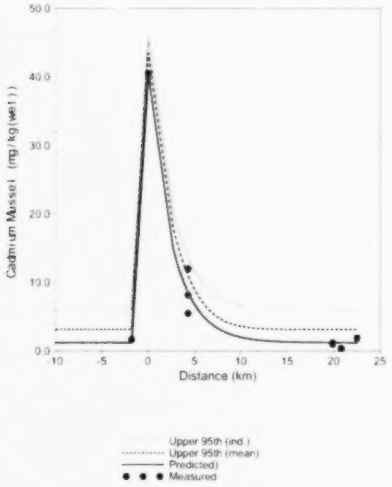
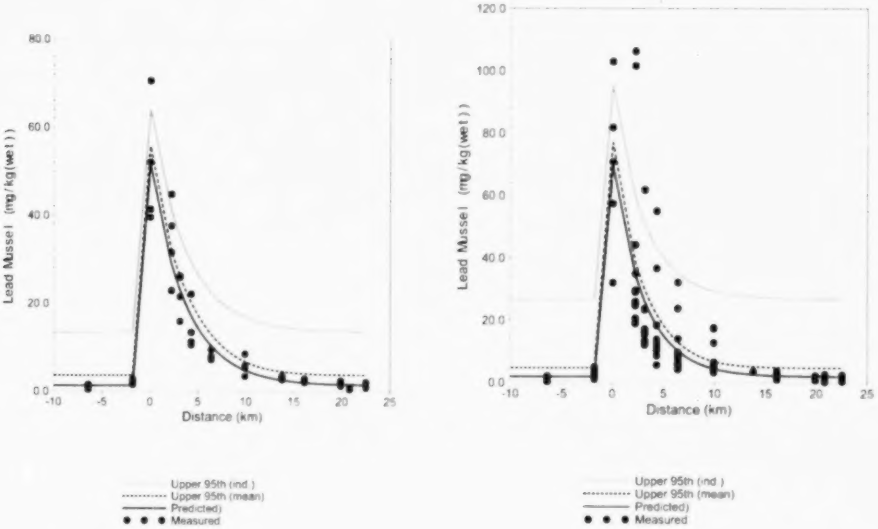


Figure A26 Lead Relationship in Mussels with Distance

a) Current

b) 1985-1999



c) 1975-1984

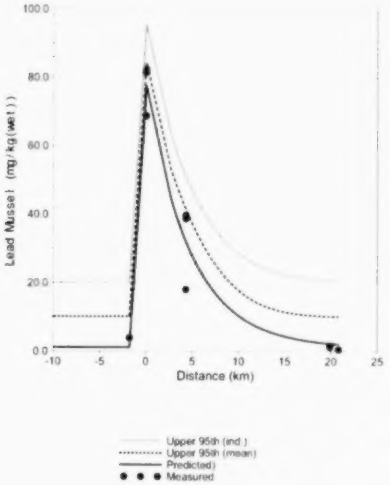


Figure A27 Thallium Relationship in Mussels with Distance for Current Time Period

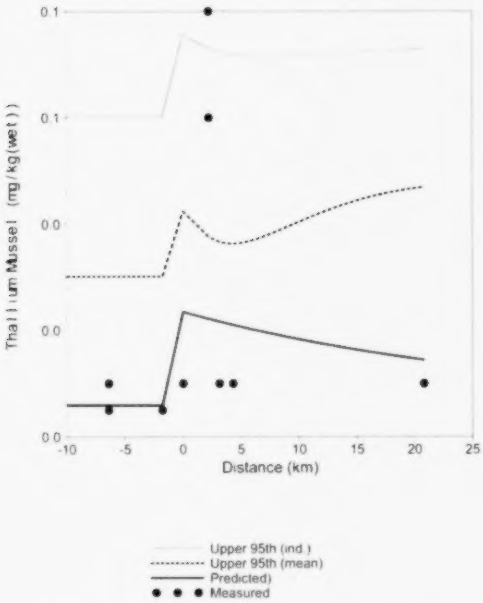
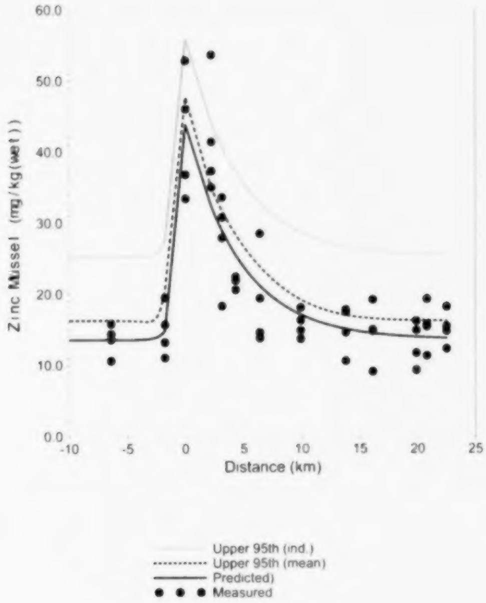


Figure A28 Zinc Relationship in Mussels with Distance for Current Period



A4.3 Calculation of EPC for Wild Mussels Using the Empirical Relationship

The empirical relationships between measured wild mussels concentration and distance were used to predict wild mussel concentration at regularly spaced locations (every 250 m) along the shoreline of each study area. The best estimate of EPC for the study area was the mean of the model estimates at each location.

The upper 95th confidence interval on the predicted mean concentration (UCLM) at each location was estimated during the regression fitting. This number provides an upper bound on the wild mussel concentration at each location; that is, it would be unlikely for the average mussel concentration at the location to exceed this value. These upper bound estimates were summarized for each study area to estimate the upper bound EPC. For Townsite #2 and Lower Belledune, the upper bound EPC is the highest UCLM estimated in the study area. This provides a conservative, or over-estimate, of the exposure concentration at the location with the highest wild mussel concentrations within the study area. For Belledune, Pointe-Verte and Petit-Rocher, the UCLMs were averaged. This provided an estimate of the upper bound for average concentrations over these study areas.

Table A4.6 shows an example for cadmium in wild mussel EPCs for Belledune and Lower Belledune during the current period. It can be seen that the Belledune wild mussel concentrations include locations to the east and to west of the industrial area. Concentrations are higher to the east and vary by about a factor of two over the eastern portion of Belledune. The best estimate of the EPC for Belledune is 0.98 mg/kg(wet) with an upper bound EPC of 1.23 mg/kg. For the Lower Belledune study area, the best estimate of average EPC for the study area is 2.12 mg/kg and the EPC for the maximum exposure is unlikely to exceed 3.30 mg/kg compared to the best estimate of 2.90 mg/kg for the maximum exposure.

Table A4.7 Examples of Predicted Air ($\mu g/m^3$) and Soil Concentrations (mg/kg)

Direction	Distance(km)	Predicted Conc	UCL95M
Cadmium Belledune Current			
East	2.7	2.9	3.3
East	2.9	2.64	3.03
East	3.2	2.42	2.79
East	3.4	2.22	2.57
East	3.7	2.05	2.38
East	3.9	1.89	2.2
East	4.2	1.76	2.05
East	4.4	1.64	1.92
East	4.7	1.54	1.8
West	1.9	0.84	1.31
West	2.2	0.81	1.12
West	2.4	0.8	1.04
West	2.7	0.8	1.02
West	2.9	0.79	1.02
West	3.2	0.79	1.02
West	3.4	0.79	1.02
West	3.7	0.79	1.02
West	3.9	0.79	1.02
West	4.2	0.79	1.03
West	4.4	0.79	1.03
West	4.7	0.79	1.03
West	4.9	0.79	1.03
West	5.2	0.79	1.03
West	5.4	0.79	1.03
West	5.7	0.79	1.03
West	5.9	0.79	1.03
West	6.2	0.79	1.03
West	6.4	0.79	1.03
West	6.7	0.79	1.03
West	6.9	0.79	1.03
West	7.2	0.79	1.03
West	7.4	0.79	1.03
West	7.7	0.79	1.03
West	7.9	0.79	1.03
West	8.2	0.79	1.03
West	8.4	0.79	1.03
West	8.7	0.79	1.03
West	8.9	0.79	1.03
West	9.2	0.79	1.03
West	9.4	0.79	1.03
West	9.7	0.79	1.03
West	9.9	0.79	1.03
West	10.2	0.79	1.03
West	10.4	0.79	1.03
West	10.7	0.79	1.03
West	10.9	0.79	1.03
West	11.2	0.79	1.03

Table A4.7 Examples of Predicted Air ($\mu g/m^3$) and Soil Concentrations (mg/kg) (Cont'd)

Direction	Distance(km)	Predicted Conc	UCL95M
West	11.4	0.79	1.03
West	11.7	0.79	1.03
West	11.9	0.79	1.03
West	12.2	0.79	1.03
West	12.4	0.79	1.03
West	12.7	0.79	1.03
West	12.9	0.79	1.03
West	13.2	0.79	1.03
West	13.4	0.79	1.03
West	13.7	0.79	1.03
West	13.9	0.79	1.03
West	14.2	0.79	1.03
West	14.4	0.79	1.03
West	14.7	0.79	1.03
West	14.9	0.79	1.03
West	15.2	0.79	1.03
	Mean	0.98*	1.23**
Cadmium Lower Belledune Current			
East	2.7	2.9	3.3
East	2.9	2.64	3.03
East	3.2	2.42	2.79
East	3.4	2.22	2.57
East	3.7	2.05	2.38
East	3.9	1.89	2.2
East	4.2	1.76	2.05
East	4.4	1.64	1.92
East	4.7	1.54	1.8
	Mean	2.12*	2.45
	Maximum	2.90	3.30**

Notes:

* best estimate EPC for the study area

** upper bound EPC for study area

A4.3 Uncertainties

Uncertainties arising from assumptions made during the HHRA were generated during:

- The use of a combination of fish muscle and whole fish sample concentrations. This is likely to overestimate fish exposures.
- Samples contained a mixture of different ages, lengths and weights of seafood samples (data which was not necessarily specified), which may not necessarily reflect what is actually consumed. For example, people are more likely to consume a 2-pound lobster than a larger lobster, which could also contain higher concentrations of certain contaminants. This could both over- or underestimate exposure.
- The use of different methods for estimating concentrations in samples below the reporting limit may impact exposure estimates. This could both over- or

underestimate exposure.

- When they were not specified, the assumption of seafood concentrations being presented in wet weights could have overestimated exposure.
- The accordance of equal weight to arithmetic or geometric means during the calculation of mean and upper bound seafood concentration for a given year could have underestimated exposure slightly.
- Uncertainty in the mussel interpolation model has been quantified by UCLM. Visual inspection of the graphs of concentration with distance indicates that the model is reasonably correct.

A5.0 Well Water Sampling

Table A5.1 provides a summary of data collected in 30 wells by the Belledune Environmental Committee (DELG, 2004). For privacy issues, geographic co-ordinates were not provided to the study team.

Table A5.1 Recent Water Concentrations (µg/L)

Location	Year	Arsenic	Cadmium	Lead	Thallium
Belledune:					
BEM1	2000	< 2	< 0.3	0.5	<0.1
BEM1	2001	< 2	< 0.3	< 0.5	<0.1
BEM10	2000	2	< 0.3	1.7	< 0.1
BEM10	2001	< 2	< 0.3	< 0.5	0.1
BEM11	2000	33	< 0.3	0.8	< 0.1
BEM11	2001	29	< 0.3	< 0.5	< 0.1
BEM12	2000	10	< 0.3	1.4	<0.1
BEM12	2001	11	< 0.3	0.5	<0.1
BEM13	2000	2	< 0.3	0.7	0.1
BEM13	2001	4	< 0.3	< 0.5	0.1
BEM14	2000	18	< 0.3	0.6	< 0.1
BEM14	2001	17	< 0.3	1.2	< 0.1
BEM15	2000	3	< 0.3	0.7	< 0.1
BEM15	2001	2	< 0.3	< 0.5	0.2
BEM16	2000	3	< 0.3	0.6	< 0.1
BEM16	2001	2	< 0.3	2.2	< 0.1
BEM17	2000	< 2	< 0.3	1.4	< 0.1
BEM17	2001	< 2	< 0.3	< 0.5	< 0.1
BEM18	2000	< 2	< 0.3	< 0.5	< 0.1
BEM18	2001	< 2	< 0.3	0.6	0.2
BEM19	2000	< 2	< 0.3	< 0.5	<0.1
BEM19	2001	< 2	< 0.3	< 0.5	0.1
BEM2	2000	2	< 0.3	1	<0.1
BEM2	2001	< 2	< 0.3	< 0.5	0.2
BEM20	2000	< 2	< 0.3	0.8	<0.1
BEM20	2001	< 2	< 0.3	0.6	<0.1
BEM21	2000	6	< 0.3	0.5	<0.1
BEM21	2001	5	< 0.3	0.7	0.1
BEM22	2000	2	< 0.3	1.1	<0.1
BEM22	2001	9	< 0.3	< 0.5	< 0.1
BEM23	2000	10	< 0.3	1.1	0.1
BEM23	2001	13	< 0.3	< 0.5	0.2
BEM24	2000	< 2	< 0.3	0.7	<0.1
BEM24	2001	< 2	< 0.3	< 0.5	<0.1
BEM25	2000	4	< 0.3	0.8	< 0.1
BEM25	2001	3	< 0.3	0.5	< 0.1
BEM3	2000	24	< 0.3	0.7	<0.1
BEM3	2001	10	< 0.3	0.5	<0.1
BEM4	2000	< 2	< 0.3	1.7	< 0.1
BEM4	2001	< 2	< 0.3	0.9	0.1
BEM5	2000	< 2	< 0.3	1	< 0.1
BEM5	2001	< 2	< 0.3	< 0.5	0.1
BEM6	2000	2	< 0.3	< 0.5	<0.1
BEM6	2001	2	< 0.3	< 0.5	<0.1
BEM7	2000	< 2	< 0.3	1.1	< 0.1
BEM7	2001	< 2	< 0.3	0.9	0.1
BEM8	2000	< 2	<0.3	< 0.5	< 0.1
BEM8	2001	< 2	<0.3	0.8	< 0.1
BEM9	2000	2	< 0.3	0.5	<0.1
BEM9	2001	2	< 0.3	0.6	<0.1

Table A5.1 Recent Water Concentrations (µg/L) (Cont'd)

Location	Year	Arsenic	Cadmium	Lead	Thallium
Belledune Centre:					
13	>=1995	<1.5	<0.5	<1	
2	>=1995	8.3	T0	T0.5	
21	>=1995	4.7	<0.5	1.97	
22	>=1995	*29	<0.5	<1	
9	>=1995	2.25	<0.5	<1	
Belledune East:					
1	>=1995	2.5	<0.5	1.4	<1
5	>=1995	<1.5	<0.5	1.5	<1
Belledune West:					
10	>=1995	<1	<0.5	1.2	<1
11	>=1995	10.1	<0.5	<1	<1
12	>=1995	<1.5	<0.5	<1	<1
13	>=1995	<1.5	<0.5	<1	<1
14	>=1995	4.4	<0.5	1.2	<1
15	>=1995	1.3	<0.5	<1	<1
16	>=1995	<1.5	1.79	<1	<1
18	>=1995	2.3	<0.5	4.2	<1
19	>=1995	<1.5	<0.5	2.66	<1
20	>=1995	<1.5	<0.5	8.72	<1
21	>=1995	<1.5	<0.5	*15.4	<1
22	>=1995	9.99	<0.5	<1	<1
24	>=1995	T0	T0	T0	T0
25	>=1995	<1	<0.5	8.7	<1
26	>=1995	T0	T0	4	T0
27	>=1995	<1.5	<0.5	1.1	<1
3	>=1995	<1.1	<0.5	2	<1
30	>=1995	*92.4	<0.5	1.12	<1
30	>=1995	*140	<0.5	<1	<1
31	>=1995	3.62	<0.5	1.08	<1
32	>=1995	3.4	<0.5	9	<1
33	>=1995	2.4	<0.5	<1	<1
34	>=1995	2	<0.5	*30	<1
35	>=1995	<1.5	<0.5	<1	<1
36	>=1995	1.2	<0.5	<1	<1
37	>=1995	1.4	<0.5	<1	<1
4	>=1995	24	<0.5	<1	<1
5	>=1995	8.3	T0	T0.5	T0.6
7	>=1995	1.1	<0.5	12.1	<1
8	>=1995	3.9	<0.5	1.3	<1
9	>=1995	<1.5	<0.5	<1	<1
Petit-Rocher:					
1	>=1995	<1.5	<0.5	3	<1
2	>=1995	<1.5	<0.5	<1	<1
3	>=1995	1.4	<0.5	1.4	<1
4	>=1995	<1.5	<0.5	<1	<1
7	>=1995	<1	<0.1	2.9	<1
Point-Verte:					
10	>=1995	7.54	<0.5	<1	<1
11	>=1995	1.7	<0.5	3.3	<1
12	>=1995	<1.5	<0.5	2.2	<1
13	>=1995	1.4	<0.5	<1	<1
14	>=1995	1	<0.1	<1	<1
15	>=1995	<1.5	<0.5	3.25	<1
16	>=1995	7.5	<0.5	<1	<1

Table A5.1 Recent Water Concentrations (µg/L) (Cont'd)

Location	Year	Arsenic	Cadmium	Lead	Thallium
17	>=1995	<1.5	<0.5	2.7	<1
18	>=1995	2.5	<0.5	1.5	<1
19	>=1995	2.2	<0.5	3.7	<1
20	>=1995	2	<0.5	<1	<1
21	>=1995	3.2	<0.5	2	<1
22	>=1995	2.2	<0.5	<1	<1
23	>=1995	3.8	<0.5	1.2	<1
24	>=1995	1	T0.07	T0.5	T0.6
25	>=1995	<1.5	<0.5	<1	<1
26	>=1995	<1.5	<0.5	*15.7	<1
27	>=1995	T2	0.2	T1.3	T0
29	>=1995	2.4	<0.5	2.3	1
30	>=1995	1.3	0.2	T1.1	2.8
31	>=1995	3.1	<0.5	<1	<1
32	>=1995	2.9	<0.1	<1	<1
33	>=1995	5.9	<0.5	2	<1
34	>=1995	*35.4	<0.5	<1	<1
35	>=1995	3.78	<0.5	<1	<1
36	>=1995	4.61	<0.5	<1	<1
37	>=1995	2	<0.1	5	<1
38	>=1995	1.59	<0.5	<1	<1
39	>=1995	<1	<0.5	1.65	<1
40	>=1995	8.87	<0.5	<1	<1
41	>=1995	4.71	<0.5	9.98	<1
42	>=1995	1.3	<0.1	3.3	<1
43	>=1995	3.7	0.5	1	<1
44	>=1995	6.6	<0.5	<1	<1
45	>=1995	<1	0.6	6.3	1.8
46	>=1995	2	T0.01	10.7	T0
47	>=1995	T0.5	0.2	9.1	T0.1
48	>=1995	<1.5	<0.5	<1	<1
49	>=1995	1.2	<0.5	2	<1
49	>=1995	<1	<0.5	1.1	<1
50	>=1995	<1	<0.5	1.8	<1
7	>=1995	1.67	<0.5	<1	<1
8	>=1995	1.2	<0.5	4.8	<1
9	>=1995	T0	T0	T0.6	T0.9

Notes: >=1995: data collected between 1995 and present
< : concentration is below reporting limit
T true
* exceeds New Brunswick guideline

Table A5.2 summarizes the well water measurement data provided by DELG and the Belledune Environmental Monitoring Committee (DELG, 2004). These data were collected beginning in the late 1980s for Belledune and from the mid 1990s for data from DELG. A value of ½ the reporting limit was used for measured values reported as below the reporting limit. Multiple measurements of the same well were averaged and these averages concentrations, by well, were then summarized. For example, there were 32 wells in Belledune that had been sampled on a year-by-year basis. The maximum average concentration was 29 µg/L and the overall average for all 32 wells was 4.96 µg/L.

The table includes summary statistics for the three areas within the vicinity but not in the GBA with the most measurements. Well concentrations in Bathurst Local Service District (LSD) and in Beresford LSD tend to be higher than concentrations in Belledune and concentrations in Nigadoo tend to be lower. Belledune data was provided by DELG for three sub areas: Belledune East wells were located east of the industrial area, Belledune Centre was the area west up to 5 km from the industrial area and Belledune West was the remaining area of Belledune. There was limited data in Belledune East and Belledune Centre compared to Belledune West; however, concentrations tended be higher in Belledune West compared to the concentrations in wells closer to the industrial facilities. These spatial patterns suggest that most of the variation in well water concentrations is likely due to natural variability and contributions to well water concentrations from the industrial facility, if any, are small compared to natural variability.

Since well locations could not be identified as being within Lower Belledune or Townsite #2 based on the available information and requirements for confidentiality, the HHRA uses the mean concentration for Belledune to represent mean concentrations in the two most exposed areas. This is likely to be a conservative assumption since the limited data suggest that well water concentrations tend to be higher in the western area of Belledune compared to the concentrations in areas nearer the industrial area.

Water for most homes in Petit-Rocher is supplied from a public system that draws water from the Nigadoo River. Water for residences on Chaleur drive in the Townsite #2 area are also provided by a public system with water from Jacquet River, from western area of Belledune, rather than from private wells. Drinking water for these areas was assumed equal to concentrations measured in well water.

Table A5.2 Summary of Well Water Concentrations (µg/L))

Location	Number of Measurements	Mean	UCL mean	Maximum
Arsenic				
Bathurst LSD	81	9.703	14.08	169
Belledune	32	4.964	6.995	32.79
Belledune Centre	5	9	20	29
Belledune East	2	1.625	7.15	2.5
Belledune West	30	6.797	13.38	116.2
Beresford LSD	83	4.59	6.279	70.8
Nigadoo	35	0.913	1.108	3.9
Petit-Rocher	5	0.83	1.151	1.4
Pointe-Verte	43	3.219	4.619	35.4
Cadmium				
Bathurst LSD	81	0.318	0.464	7.3
Belledune	32	0.219	0.234	0.3
Belledune Centre	5	0.2	0.307	0.25
Belledune East	2	0.25	0.25	0.25
Belledune West	30	0.276	0.368	1.79
Beresford LSD	83	0.298	0.414	5.5
Nigadoo	35	0.214	0.243	0.5
Petit-Rocher	5	0.21	0.295	0.25
Pointe-Verte	43	0.226	0.254	0.6
Chromium				
Bathurst LSD	81	9.735	11.36	37
Belledune	32	1.311	1.448	3.3
Belledune Centre	5	7.2	10.92	14
Belledune East	2	14	70.82	23
Belledune West	30	11.68	14.13	33
Beresford LSD	83	8.759	9.952	32
Nigadoo	35	7.514	8.836	21
Petit-Rocher	5	13.4	19.75	23
Pointe-Verte	43	9.53	11.21	23
Lead				
Bathurst LSD	81	1.831	2.343	15.7
Belledune	32	1.298	1.706	6.72
Belledune Centre	5	0.794	1.421	1.97
Belledune East	2	1.45	1.766	1.5
Belledune West	30	3.666	5.635	30
Beresford LSD	83	4.041	5.982	85.7
Nigadoo	35	1.77	2.42	10.1
Petit-Rocher	5	1.66	2.837	3
Pointe-Verte	43	2.489	3.335	15.7
Thallium				
Bathurst LSD	81	0.496	0.526	1.7
Belledune	32	0.073	0.091	0.37
Belledune East	2	0.5	0.5	0.5
Belledune West	30	0.47	0.51	0.6
Beresford LSD	83	0.489	0.517	1
Nigadoo	35	0.533	0.598	1.4
Petit-Rocher	5	0.5	0.5	0.5
Pointe-Verte	43	0.574	0.685	2.8

Table A5.2 Summary of Well Water Concentrations (µg/L)) (Cont'd)

Location	Number of Measurements	Mean	UCL mean	Maximum
Zinc				
Bathurst LSD	81	30.19	37.51	246
Belledune	32	55.03	77.13	358.8
Belledune East	2	39.5	232.1	70
Belledune West	30	50.06	71.42	300
Beresford LSD	83	45.59	57.86	343
Nigadoo	35	35.09	52.25	329
Petit-Rocher	5	21.7	38.47	44
Pointe-Verte	43	52.58	70.78	326

A6.0 Wild Game Concentrations

Noranda collected three rabbits and three partridges during 2004 from Noranda property within the industrial area (Brunswick Mining and Smelting Corporation, 2004c). The concentrations of COPC in these animals was determined using ICP analysis (RPC laboratory) and these concentrations are presented in Table A6.1. The measured concentrations of arsenic, chromium, mercury, thallium and all but one measured of cadmium were given as below the reporting limit (i.e."<"). For lead and zinc, the concentrations in rabbit were 2 to 3 times higher than the concentrations in partridge with the exception of lead and cadmium.

Table A6.1 Measured Concentrations in Wild Game (mg/kg(wet))

	Partridge			Rabbits		
COPC	**PG-01-04**	**PG-02-04**	**PG-03-04**	**Rb-01-04**	**Rb-02-04**	**Rb-03-04**
Arsenic	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	0.08	<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Lead	1.37	0.07	0.11	0.26	0.18	0.12
Mercury	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Zinc	4.5	3.8	4.2	9.7	8	9.9

Uncertainty in these concentrations arises mainly from the number of measurements below the reporting limit.

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